



# Market study on competition in online payments

Final Report

Prepared by



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## **Abstract**

This study analyses the intensity of competition in the online payment sector in the EEA, with a focus on 14 countries. For the purpose of the study, online payments refer to electronic payments made by consumers to merchants for goods and services purchased online.

A novel database allows to identify the most commonly used payment methods and the main operators offering them in the period 2018-2022. A consumer survey and a consultation of various industry stakeholders complement the data, providing evidence on the drivers of consumers' and merchants' choice of payment method, as well as on the competitive relationship among providers of payment methods. Finally, a behavioural experiment provides original evidence on the causal effect of display practices on consumer choice of payment method.

Based on these inputs, the study examines the competitive dynamics in the sector and the main recent market developments, and finds that while innovative payment methods have emerged, traditional methods such as cards maintain a strong presence in many of the selected countries.

Considering certain structural features of the sector which may be conducive to entrenchment of market power, the study focuses on the competitive role and incentives of international card schemes, banks, Big Tech companies and Paypal.

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## Executive summary

The fast pace of changes in online payments influences competition and requires competition enforcement agencies to keep abreast of the relevant technological developments and the newly emerging business models in this space. This study systematically analyses the online payment sector in the EEA by providing novel data on the value and volume of transactions of the main payment methods, assessing the competitive dynamics in the online payment arena and analysing practices that risk favouring or entrenching the position of established players.

The study triangulates multiple sources, including quantitative data, a consumer survey and a stakeholder consultation. It covers fourteen countries in the EEA: Austria, the Czech Republic, Denmark, France, Germany, Hungary, Greece, Italy, Latvia, the Netherlands, Poland, Portugal, Spain, and Sweden. The period of analysis is 2018-2022.

Consumers engage in e- or m-commerce using various devices, including mobile (e.g., smartphones, wearables, tablets) and non-mobile (e.g., desktop PCs, cards). These devices host applications that facilitate payments, such as Apple Pay on iPhone or gift cards in merchant apps. The applications use different payment services, like direct debits, credit transfers, card payments, and SEPA-wide e-money.

For the purpose of this study an “online payment method” is defined as a combination of these devices, applications, and payment services. The online payment methods examined in this study include credit and debit cards, bank transfers, account to account solutions and digital wallets.

The data collected – corroborated by the qualitative evidence provided by the consumer survey and the stakeholder consultation – is used to systematically analyse the relevant online payment methods in the EEA, and their evolution in the last 5 years. The consumer survey gathers insights on the determinants of consumer preferences regarding online transactions and explores the effectiveness of display practices in influencing consumer choices. The stakeholder consultation provided valuable insights into the perspectives of key players in the online payment arena, including international and domestic card schemes, large and small merchants, issuing banks, national payment methods, digital wallet providers, both established ones and relatively newer players such as the Big Tech companies.

The online payment sector is inherently characterized by certain structural features that contribute to raising barriers to entry and/or expansion for market players. Network effects, brand recognition, highly complex and costly technological standards render the scale a crucial factor to compete effectively in this sector. The market forces stemming from these structural features have led to the concentration of significant shares of supply in the hands of established industry players, in particular International Card Schemes (ICS) and Paypal, across several Member States, despite recent changes and the shifting competitive dynamics.

The study shows credit card- and debit card-based payment methods are widely used across the EEA and, despite the recent market developments, they maintain a strong market position in many of the selected countries. While digital wallets are becoming more and more important, this may further reinforce also the relevance of cards, and more specifically, ICS. This growth has been driven by the increasing relevance of digital wallets offered by Big Tech companies (Apple Pay, Google Pay, Amazon Pay). Despite Paypal's long-standing presence in the EEA, its usage is declining in certain countries. Payment initiation services (PIS) and buy-now-pay-later (BNPL) solutions are gaining traction, particularly in Poland, the Netherlands, and the Nordic countries, but they remain marginal in some Member States.

Given the structural features of the sector, it is important that competition enforcement is sufficiently agile and addresses market conduct that may be capable of distorting competition, before its effects become harder to tackle and the established players' market position becomes more and more entrenched. To this end, this study aims at providing a framework to assess potential practices that could raise concerns under EU competition law.

While the triangulation of sources that have informed this study – data, desk research, consumer survey, stakeholder consultation – does not aim at conclusively identifying the existence of anticompetitive behaviour, the information collected plays a critical role in understanding the incentives of market players and the potential effects of conduct that leverages market power.

The remainder of this summary provides an overview of the methodology and findings of each chapter, discussing the main quantitative insights provided in chapter 1, the large-scale consumer survey on the habits and attitudes of European consumers regarding online payments in chapter 2, the main competitive dynamics in chapter 3 and of the potential sources of competitive concerns in chapter 4.

## **Chapter 1 – Market overview**

Chapter 1 presents new data on the structure and evolution of the online payment sector in the EEA. Given the lack of commonly agreed standards for reporting online payment transaction volumes and values, it also establishes key definitions and a taxonomy that will be used consistently throughout the report, including in the competitive assessment and behavioral experiment of the study.

The data is based on the E-Commerce Analytics report from GlobalData, which provides the value of e-commerce transactions, a breakdown of e-commerce payments by various payment methods and in-app payments data. The foundation in the data is rigorous secondary research.

Key findings reveal credit cards consistently rank high among the most used payment methods, except for Hungary. In this country, as well as Poland and Portugal, debit cards have a higher share. Specifically, France, Greece and Spain have the highest value share of credit cards. Conversely, Spain, Greece and Portugal have the highest value share of debit cards.

The use of digital wallets varies, with Italy and Germany showing a higher preference for staged digital wallets compared to pass-through primarily due to Paypal. In many other countries, on the other hand, the use of pass-through wallets is higher, and this may be related to Apple Pay and Google Pay covering higher shares of e-commerce transactions in these countries.

The use of online banking is increasing in every analysed country, and especially in Poland, Portugal and Netherlands. These countries have witnessed the emergence of (respectively) BLIK, MBWay and iDEAL, which are popular payment applications at the domestic level.

The BNPL option is widely used in Germany and Sweden. This is because Klarna has a significant market presence. Cash on delivery is particularly popular in Czech Republic.

The chapter also highlights device preferences for e-commerce, with desktops and smartphones being the most preferred. On average, 59% of consumers prefer desktops for online shopping, followed by smartphones at 48%.

France and Germany lead in e-commerce transaction values, particularly via desktop browsers. Italy and Spain have a higher share of mobile payments compared to the other countries. Portugal and Sweden display a balanced mix of desktop and mobile transaction values. Overall transaction values have steadily increased from 70,078

million EUR in 2018 to 101,656 million EUR in 2022, with projections for continued growth.

The chapter also examines the costs associated with different payment methods. Next to cardholder fees consumers typically do not incur other additional costs for payment methods like credit cards, debit cards, credit transfers, direct debits, and various wallet options. However, merchants bear transaction fees that can range from a fixed amount to a percentage of the transaction value, influenced by factors such as the payment method, service provider, and regulatory frameworks like the EU Interchange Fee Regulation. Various business models are employed by payment service providers, including commission-based, freemium, and subscription models.

Finally, this chapter estimates business volumes generated by ICS in e-commerce transactions using digital wallets. The results offer approximate insights into the role of ICS and digital wallets in e-commerce markets. While there are significant variations across countries, estimates suggest that 27.6% of ICS transactions are processed through digital wallets.

## **Chapter 2 – Positioning and consumer choices**

The aim of this chapter was to gain evidence and insights on the determinants of consumer behaviour to feed into the competitive analysis. In particular, it meant to explore the effects on payment method choices of direct factors, which refer to the platform and payment methods characteristics, and indirect factors, related to the external environment and individual attributes.

This chapter focused primarily on direct factors, analysing in depth three payment method display practices that can influence consumer decision when it comes to picking a payment method. As such it focused on a) up-streaming, b) default option, and c) show-more. However, considerable attention was also given to the indirect factors, which may act as catalysts to these practices.

Four data collection activities were leveraged to gather consumers' perspective and ensure robustness of the data used.

The starting point of the data collection was a literature review. The review was used to build a theoretical model mapping the different factors influencing payment method decision. The research then was extended with a mystery shopping to scope the different display practices on the market as well as the conditions under which they are implemented. Based on the insights gathered through the review and mystery shopping, a large-scale consumer survey was conducted gathering the habits and attitudes of Europeans regarding online payments. This survey was coupled with a behavioural experiment consisting in an online shopping task on a mock-up e-commerce platform. The experimental approach embedded in the shopping task tested the capacity of display practices in swaying consumers towards different payment methods.

The mystery shopping, consumer survey and behavioural experiment covered 14 MS, and for the latter two, the national language was used.

The analysis made use of descriptive statistics, a segmentation based on individuals' portfolio of payment methods, and two multivariate regressions. The regressions were used to determine the influential factors that increase the impact of display practices on consumer choice such as prices of purchase or device used. Additionally, they served to understand the most common characteristics of the different segments of the population.

Overall, the data analysis and regressions revealed that the examined display practices have an effect on consumer choice. According to the experiment data, show-more was the display practice with the strongest impact on shoppers, with about 80% of participants deviating from their initial payment choice. The default option and

upstreaming were less effective but remain considerably influential on payment method decision with respectively 22% and 15% of shoppers changing their payment method when exposed to the practice. In general, results show that the display practices were more likely to nudge respondents into changing payment method (compared to the one chosen in task 1 of the experiment) when they decreased purchasing convenience. For instance, when additional clicks were added to picking a payment method (show-more display) consumers were more likely to switch to a different one.

In addition, the survey data suggested that the effect size of the impact of these practices depend not only on the essence of the practice but also on the individual and the context in which they make the decision. In fact, the data and analysis revealed that the portfolio (number and type) of payment methods individuals own, as well as their openness to novelty and levels of digitalisation, influenced the effect size of the practices included in the experiment. Lastly, the fact that practices are more effective on individuals purchasing on e-commerce platforms they are familiar with and on more trivial purchases (cheaper) point to their reliance on rapid decision making.

Based on these insights, it is clear that display practices can be leveraged by e-commerce platforms or payment service providers to influence consumer choice when it comes to payment method.

### Chapter 3 – The intensity of competition

The relationships between providers of payment methods can be of horizontal and/or of vertical nature. Card schemes, for example, may provide an input to digital wallets, while competing with them at the check-out page of e-commerce platforms.

Stakeholders who contributed to our consultation suggest that providers offering different payment methods or relying on different payment services perceive each other as close competitors. ICS perceive competition from local schemes and local players, digital wallet providers among others. Similarly, domestic schemes and account-to-account (A2A) operators perceive the competitive threat of ICS, and card and non-card-based payment methods perceive each other as competitors.

Looking at broad aggregates, however, may hide the actual competitive strength of certain market players and, possibly, competitive constraints.

This chapter investigates the parameters of competition by looking at the determinants of consumers' choice and merchants' acceptance. Moreover, it investigates the constraints operators face to their ability to expand their offering to different payment methods.

Consumers' demand and merchants' acceptance are largely intertwined. Online payment platforms are two-sided markets, characterized by indirect network effects: the more consumers use one payment method, the more merchants will be willing to accept it; the more merchants accept a payment method, the more valuable it becomes to consumers that use it.

Absence of transaction costs, security features, reputation of the providers, ease of use are among the most relevant dimensions consumers consider when signing up for a new payment method. Some of these factors, namely ease of use and security perceptions, tend to increase with usage, thereby reinforcing consumers' preferences for a given payment method, favouring the reputation of the providers and, in turn, merchants' acceptance. Merchants have to tailor acceptance of payment method to their consumers expected preferences, to ultimately maximise reach among consumers and reduce drop-out rates. Costs considerations also play a role.

Contractual arrangements with payment method providers may encourage merchants to steer consumer choices toward options that are more economically advantageous for them. The behavioural experiment in Chapter 2 suggests that merchants could

potentially leverage display practices to influence the selection of payment methods away from the preferred method. However, survey results also reveal consumers appear reluctant to register for new payment methods. Additionally, while they may own multiple payment methods, most of them frequently use no more than two. The above considerations suggest payment methods acceptance necessitates careful evaluation by merchants, who must ensure they minimize drop-off rates at checkout while also controlling costs. Merchants may tend to accept multiple payment methods, to cater for different consumers preferences. The respondents to the questionnaire, for instance, indicated they offer multiple payment methods, with an average of nearly 8 different options to pay.

Stakeholder consultations reveal several factors that may hinder a provider's ability to switch from one payment method to another. These include challenges such as expanding across borders, developing a sufficient network of banks or payment service providers in other Member States, ensuring merchant acceptance and brand recognition, and integrating with various payment services. To the extent different payment methods serve the same consumer and merchant needs, these factors can create friction, reducing the competitive pressure one payment method can exert on another.

#### Chapter 4 - The potential source of competitive concerns in the online payment sector

This study seeks to provide a framework for evaluating potential practices that may distort competition in online payments. It focuses on the role of specific market players: ICS, Big Tech companies, banks, and Paypal.

##### The role of ICS

Despite recent market developments, cards are still widely used in the online payment sectors both directly and through digital wallets. International card schemes, and in particular Visa and Mastercard, have a role of particular prominence. Capgemini estimates indicate that the median values of Visa and Mastercard shares of e-commerce card transactions are 45% and 53%, respectively, in 11 of the 14 selected countries.

The results of the consumer survey suggest that, on average, 64% of consumers in the selected countries own a payment card, making cards the most widespread payment method among respondents, together with Paypal; and that nearly all of these consumers (96% on average across the 14 selected countries) own a card with one of the Visa and Mastercard brands (Maestro, Mastercard, V-Pay, Visa).

Relatedly, the vast majority of the merchants surveyed by the Project Team consider ICS cards as must-haves.

The latter results have important implications for the competitive dynamics in the sector: it follows, indeed, that a share of the demand is non-contestable for Visa and Mastercard, i.e. consumers will choose to pay through Visa and Mastercard cards regardless of what other payment methods are available.

Visa and Mastercard are therefore necessary “commercial partners” for the majority of market participants of different categories, including: i) merchants, ii) acquirers and payment service providers (PSPs), iii) issuers (both banks and neo-banks), iv) providers of payment applications that use these card schemes’ infrastructure (notably, digital wallets).

Given their must-have status and position of superior bargaining power, there are some practices that – if implemented – could entrench Visa and Mastercard market power and alter competition in the online payment sector. The purpose of this chapter is not to conclusively identify the existence of anticompetitive behaviour, but to provide a framework to assess the competitive implications of the potential conducts that ICS may implement. These conducts could envisage:

- increases in the fees that acquirers (thus merchants) pay. The relevance of ICS is such that they would not lose significant portions of demand if they implemented such increases;
- agreements with acquirers (or directly with merchants, although very rare) requiring or incentivizing acquirers or PSPs (or directly merchants) not to accept competing payment methods.
- agreements with acquirers (or directly with merchants, although very rare) mandating a preferential treatment for ICS with respect to their rivals, e.g. through a more favourable display by merchants, or through prioritization by merchants and/or digital wallet providers of ICS' payment applications in transactions through co-badged cards. Some patterns in the results of the behavioural experiment suggest that display practices may be effective especially when they nudge consumers to pay through cards.

Competition authorities in other jurisdictions have considered whether ICS may be able to propose volume rebate schemes to merchants and their acquirers or PSPs, whereby these players are granted financial incentives past a certain threshold in terms of transaction volumes. In exchange for these incentives, ICS may be able to obtain a preferential treatment without contractually imposing it.

To the extent that accepting such conditions is a necessary condition to contract with them, or that the financial benefits ICS grant to their commercial counterparts are not replicable by competitors, these practices – if implemented – could harm (i) other international card schemes, (ii) domestic card schemes, (iii) providers of alternative, non-card based payment methods by depriving them of sufficient scale to compete effectively.

ICS play an important role for digital wallet providers, including Big Techs. This dynamic could encourage ICS to foster closer relationships with digital wallets, potentially influencing the scope of their partnerships with other card schemes or steering the development of non-card-based products. ICS may also encourage wallets to prioritize their networks, particularly in the case of co-badged cards. These factors, supported by ICS's bargaining power, can influence the competitive landscape of online payments.

Big Techs digital wallets, with their large user bases, are particularly attractive to ICS. Their market presence gives them a competitive edge in the wallet sector and represents an opportunity for ICS to strengthen their position. Even if they rely solely on cards, they could become potential competitors to ICS by influencing the development of alternative payment systems. Competition authorities in other jurisdictions have made allegations that ICS may have the ability and incentives to secure strategic agreements with Big Techs aimed at discouraging payment methods based on alternative payment rails to gain scale.

Competition authorities in other jurisdictions have raised concerns regarding the potential implementation of some of the practices mentioned above by Visa and/or Mastercard, although these investigations are still in the early stages. Our stakeholder consultation suggests, though in a limited and inconclusive manner, that some market participants suspect that the conduct of ICS could align with such practices.

Chapter 4 describes in detail how such agreements could be designed in practice and their potential effects of competition in online payments.

### **The role of banks**

Issuing banks play a significant role in online payments, facilitating credit transfers, direct debits, and card-based payments. They are also involved in A2A payment solutions, often offering proprietary applications in collaboration with other banks. For example, in several European countries, banks have developed popular local A2A

solutions like iDEAL, Blik, Bizum, and others. These initiatives often remain regional due to the need for technical and commercial support from banks. Recently, banks have teamed up to create cross-border solutions, such as EPI/Wero and the EuroPA Project.

While these collaborations could challenge established global players, they may also lead to antitrust concerns, especially if they restrict competition through coordinated practices.

Stakeholders expressed concerns that banks may hinder third-party payment service providers (PISPs) by offering poor-quality APIs, limiting the number of payments, or charging additional fees for making credit transfers through independent third-party providers. The information provided by the stakeholders which participated in the consultation also suggests that this behaviour may be driven, *inter alia*, by the fact that banks want to support their proprietary payment solutions.

Chapter 4 discusses the extent to which these practices could raise concerns under EU competition law.

### The role of Big Techs

Our stakeholder consultation, albeit based on a limited number of respondents, reveals that digital wallets offered by Big Tech companies are increasingly viewed as essential by merchants. A relevant share of them (7 out of 18 online merchant respondents) considers Big Tech's digital wallets as "must-have" solutions for their online business. Most of them specifically identified Apple Pay as a "must-have" payment solution.

The European online payment market has undergone significant transformation with the entry and expansion of Big Tech companies, driven by increasing consumer demand for convenience, security, and seamless transaction experiences.

The reasons for the rapid growth of Big Tech wallets, especially Apple Pay and Google Pay, are manifold. First of all, digital wallets are widely used for online shopping on mobile devices, due to their convenience and perceived security over physical cards, a trend observed for 13 out of 14 Member States according to the consumer survey presented in chapter 2. Big Techs are therefore well-positioned to capitalize on this trend and continue to increase their influence in the future. Moreover, the integration of Big Tech wallets into broader ecosystems confers them a decisive competitive advantage. Apple Pay and Google Pay, for example, provide seamless integration of payment cards across both physical and digital channels, making Big Tech wallets more appealing to consumers and contributes to their growing significance, often at the expense of standalone competitors. This leads to another advantage of Big Tech wallets, i.e. their perceived security and convenience with respect in particular to traditional debit or credit cards, which emerges both from the consumer survey and from the merchant consultation.

Big Tech firms might leverage their position in non-financial markets to establish and expand their footprint in financial services. These could potentially limit access to other players, favour proprietary solutions, create dependencies, and ultimately affect the competitive landscape.

First, the stakeholder consultation revealed some concern about potential access restrictions that could be put in place by Big Tech platforms. They might be able to impose conditions for accessing their platforms or restrict such access altogether. However, they would have an incentive to do so to the extent such practice, by foreclosing competitors in the online payment sector, allows them to expand their profits in the digital payment sector without significant losses in the vertically integrated markets (e.g. operating system and app stores).

Another potential source of concern is the fact that Big Tech companies, through their control of major digital platforms, possess unparalleled access to vast amounts of user

data, which they could leverage either by entering in partnership with incumbents, selling data and offering key services such as data analysis or cloud services, or by combining it with offering their own online payment method directly to customers. This ability to integrate payment data with broader digital ecosystems not only enhances their competitive position but also allows them to extract greater value compared to traditional financial institutions. Data integration improves user experience also in the online payment sector and creates dependencies further reinforcing their role in this sector. Our consultation with stakeholders revealed some concerns about the possibility for Big Techs to leverage the data they collect through their ecosystems. The full implications of this use of extensive databases by Big Techs for their online payment methods are not yet fully evaluated. It appears likely that they can leverage the data collected through their payment services to enhance their core businesses, such as search engines, social media platforms, and online marketplaces, by gaining deeper insights into individual customer habits, needs and preferences.

Finally, some strategies may entail creating dependencies through preferential treatment of proprietary payment solutions. Big Techs' entrenched position in other platform services such as social media and app stores may allow them to give preferential treatment in terms of more favourable display options to their own payment solutions to the detriment of competitors. This may happen both on their own platforms and on third-parties online stores, since Big Techs may be able to leverage their large user base to obtain more favourable arrangements in terms of display options.

Merchant and payment applications provider consultations reveal the existence of preferential display practices favouring Big Tech payment solutions in both their own platforms/devices and third-party online shops. Stakeholders suggest that such practices may stem from contractual arrangements between Big Tech firms and merchants or result from platform-imposed restrictions (i.e. through the implementation of APIs).

A related practice is bundling, whereby Big Techs may exploit consumer preferences for services in which they have strong market positions to boost their payment solutions. The stakeholder consultation suggests there is some concern in the online payment arena that Big Tech firms may use their market power in areas such as operating systems, online advertising, or app distribution to encourage or require the adoption of their proprietary payment solutions. This may alter competition by creating advantages for Big Tech wallets by reducing the visibility and attractiveness of rival payment methods, potentially limiting consumer choice. Moreover, bundling could be used to compel other payment service providers to integrate with or rely on Big Tech's infrastructure if they wish to remain available on these platforms, further reinforcing Big Tech's influence over the digital payments ecosystem and creating dependency. Such concerns have led competition authorities in other jurisdictions to closely look at Big Techs' conduct in the online payment sector.

### **The role of Paypal**

Alongside ICS, banks, and Big Tech companies, Paypal has been a successful player in the payments landscape for years, and today it captures significant e-commerce transactions in countries like Austria, Germany, Italy, and Spain.

The merchants contributing the consultation considered Paypal a "must-have" payment method for their browser, app, or both. The results of the consumer survey confirm Paypal's popularity among consumers in the EEA: 65% of respondents reported they own Paypal – a share comparable to that of cards; and this share is relatively higher in Austria, Germany, Italy and Spain.

Paypal has likely maintained its position in the online payments market due to its first-mover advantage, trustworthiness, and strategic use of a two-stage wallet system. Its

early entry in 2004, acquisition by eBay, and P2P functionality contributed to rapid growth.

In recent years, however, Paypal has begun losing relevance, potentially in favour of Big Tech wallets, particularly Apple Pay.

Paypal's decline can be attributed to several key factors. One major reason is that customers increasingly prefer seamless, privacy-conscious checkout experiences, but Paypal's complex identity verification and account setup processes detract from these expectations. In 2018, eBay shifted its payment operations to Adyen, a more seamless alternative, which likely contributed to a loss of consumer trust in Paypal. Additionally, Big Tech companies, such as Apple Pay and Google Pay, with their strong network effects, large user bases, and advanced technologies, have posed a significant challenge to Paypal's position in the market.

Another factor is that Paypal remains primarily confined to online markets, while mobile payment solutions from Big Tech companies offer greater convenience with NFC-enabled contactless payments, which are increasingly valued by consumers. Furthermore, the rise of new payment methods, such as A2A solutions and BNPL services, has intensified competitive pressure.

In this context, Paypal might have engaged in practices aimed at preserving their position in the online payment market, such as favourable display practices. The extent to which these practices, if any, can distort competition depends on market power. This, in turn, depends on Paypal's "must-have" status, which may vary across countries.

## Zusammenfassung

Die rasanten Veränderungen im Bereich der Online-Zahlungen beeinflussen den Wettbewerb und erfordern von den Wettbewerbsbehörden mit den relevanten technologischen Entwicklungen und den neu entstehenden Geschäftsmodellen in diesem Sektor Schritt zu halten. Diese Studie analysiert systematisch den Sektor der Online-Zahlungen im Europäischen Wirtschaftsraum (EWR), indem sie neue Daten zum Transaktionsvolumen und -wert der wichtigsten Zahlungsmethoden liefert, die wettbewerblichen Dynamiken im Bereich der Online-Zahlungen bewertet und Praktiken untersucht, die dazu beitragen könnten, die Marktstellung etablierter Akteure zu begünstigen oder zu verfestigen.

Die Studie stützt sich auf verschiedene Quellen, darunter quantitative Daten, eine Verbrauchenumfrage und eine Konsultation mit Interessenträgern. Sie umfasst vierzehn Länder im EWR: Österreich, Tschechien, Dänemark, Frankreich, Deutschland, Ungarn, Griechenland, Italien, Lettland, die Niederlande, Polen, Portugal, Spanien und Schweden. Der Analysezeitraum erstreckt sich von 2018 bis 2022.

Verbraucher nutzen für E- oder M-Commerce verschiedene Endgeräte, darunter mobile (z. B. Smartphones, Wearables, Tablets) und nicht-mobile Geräte (z. B. Desktop-PCs, Karten). Auf diesen Geräten laufen Anwendungen, die Zahlungen ermöglichen, wie etwa Apple Pay auf dem iPhone oder Geschenkkarten in Händler-Apps. Diese Anwendungen verwenden unterschiedliche Zahlungsdienste, etwa Lastschriften, Überweisungen, Kartenzahlungen oder SEPA-weite E-Geld-Zahlungen.

Für die Zwecke dieser Studie wird eine „Online-Zahlungsmethode“ als Kombination aus Gerät, Anwendung und Zahlungsdienst definiert. Die untersuchten Zahlungsmethoden umfassen Kredit und Debitkarten Zahlungen, Banküberweisungen, Konto-zu-Konto-Lösungen sowie digitale Geldbörsen.

Die gesammelten Daten – ergänzt durch qualitative Erkenntnisse aus der Verbrauchenumfrage und der Stakeholder-Konsultation – werden verwendet, um systematisch die relevanten Online-Zahlungsmethoden im EWR und deren Entwicklung in den letzten fünf Jahren zu analysieren. Die Verbrauchenumfrage liefert Einblicke in die Bestimmungsfaktoren des Verbraucherverhaltens bei Online-Transaktionen und untersucht, wie effektiv Anzeigepraktiken Konsumententscheidungen beeinflussen. Die Stakeholder-Konsultation wiederum bietet wertvolle Perspektiven zentraler Marktteilnehmer im Bereich der Online-Zahlungen, darunter internationale Kartensysteme, große Technologieunternehmen, große und kleine Händler, ausgebende Banken, neue Zahlungsarten sowie etablierte digitale Geldbörsen wie.

Der Sektor der Online-Zahlungen ist von strukturellen Merkmalen geprägt, die Markteintritts- und Wachstumshürden für Anbieter erhöhen. Netzwerkeffekte, Markenbekanntheit sowie komplexe und kostspielige technologische Standards machen Skaleneffekte zu einem entscheidenden Wettbewerbsfaktor. Diese strukturellen Marktkräfte haben dazu geführt, dass bedeutende Marktanteile in den Händen etablierter Anbieter – insbesondere der internationalen Kartensysteme und Paypal – konzentriert sind, auch wenn sich der Markt zuletzt gewandelt hat.

Die Studie zeigt, dass auf Kredit- und Debitkarten basierende Zahlungsmethoden im EWR weit verbreitet sind und trotz aktueller Entwicklungen in vielen untersuchten Ländern eine starke Marktposition beibehalten. Während digitale Geldbörsen zunehmend an Bedeutung gewinnen, könnte dies die Relevanz von Karten – insbesondere von ICS – noch weiter verstärken. Das Wachstum dieser digitalen Geldbörsen wird vor allem durch die steigende Verbreitung von Lösungen großer Technologieunternehmen (Apple Pay, Google Pay, Amazon Pay) getrieben. Trotz der lang-jährigen Präsenz von Paypal im EWR geht dessen Nutzung in einigen Ländern zurück. Zahlungsinitiierungsdienste (PIS) und „Buy Now, Pay Later“ (BNPL) Lösungen

gewinnen vor allem in Polen, den Niederlanden und den nordischen Ländern an Bedeutung, sind jedoch in anderen Mitgliedsstaaten noch wenig verbreitet.

Angesichts der strukturellen Merkmale des Sektors ist es wichtig, dass die Durchsetzung des Wettbewerbsrechts ausreichend agil ist und Marktverhalten anspricht, das den Wettbewerb verzerren könnte – bevor dessen Auswirkungen schwerer zu bekämpfen sind und die Marktstellung etablierter Akteure zunehmend gefestigt wird. Ziel dieser Studie ist es, einen Rahmen zur Bewertung potenzieller Praktiken bereitzustellen, die unter dem EU-Wettbewerbsrecht möglicherweise Anlass zu Bedenken geben könnten.

Die in dieser Studie verwendete Triangulation – bestehend aus Daten, Sekundäranalysen, Verbraucherumfragen und Stakeholder-Konsultationen – soll nicht abschließend das Vorliegen wettbewerbswidrigen Verhaltens feststellen, die gesammelten Informationen spielen jedoch eine entscheidende Rolle beim Verständnis der Anreize der Marktakteure und der potenziellen Auswirkungen eines marktmächtigen Verhaltens.

Der verbleibende Teil dieser Zusammenfassung gibt einen Überblick über Methodik und Ergebnisse der einzelnen Kapitel: Kapitel 1 beleuchtet die wichtigsten quantitativen Erkenntnisse, Kapitel 2 berichtet über die europaweite Verbraucherumfrage zu Zahlungsgewohnheiten und Einstellungen, Kapitel 3 analysiert die zentralen Wettbewerbsdynamiken, und Kapitel 4 identifiziert mögliche Quellen für wettbewerbsrechtliche Bedenken.

## Kapitel 1 – Marktüberblick

Kapitel 1 stellt neue Daten zur Struktur und Entwicklung des Online-Zahlungssektors im EWR vor. Aufgrund fehlender allgemein anerkannter Standards zur Erfassung von Volumen und Werten von Online-Zahlungstransaktionen werden in diesem Kapitel zudem zentrale Definitionen und eine Taxonomie eingeführt, die im gesamten Bericht – einschließlich der wettbewerbsrechtlichen Bewertung und des Verhaltens-Experiments – konsistent verwendet werden.

Die Daten basieren auf dem „E-Commerce Analytics“ Bericht von GlobalData, der Informationen zum Wert von E-Commerce-Transaktionen, eine Aufschlüsselung nach Zahlungsmethoden sowie In-App-Zahlungsdaten liefert. Grundlage der Daten ist eine fundierte Sekundärforschung.

Wichtige Erkenntnisse zeigen, dass Kreditkarten – mit Ausnahme von Ungarn – konstant zu den am häufigsten genutzten Zahlungsmethoden gehören. In Ungarn sowie in Polen und Portugal hingegen haben Debitkarten einen höheren Marktanteil. Besonders in Frankreich, Griechenland und Spanien ist der Wertanteil von Kreditkartenzahlungen am höchsten. Im Gegensatz dazu weisen Spanien, Griechenland und Portugal den höchsten Wertanteil von Debitkarten Zahlungen auf.

Die Nutzung digitaler Geldbörsen variiert: In Italien und Deutschland besteht eine höhere Präferenz für sogenannte „staged wallets“ im Vergleich zu „pass-through wallets“, was vor allem auf die Nutzung von Paypal zurückzuführen ist. In vielen anderen Ländern hingegen ist der Einsatz von „pass-through wallets“ verbreiteter – möglicherweise aufgrund der hohen Verbreitung von Apple Pay und Google Pay, die dort größere Anteile am E-Commerce-Transaktionsvolumen abdecken.

Online-Banking wird in allen untersuchten Ländern stark genutzt, insbesondere jedoch in Polen, Portugal und den Niederlanden. In diesen Ländern sind nationale Anbieter wie BLIK (Polen), MBWay (Portugal) und iDEAL (Niederlande) entstanden, die als In-App-Zahlungslösungen auf nationaler Ebene beliebt sind.

Die Option BNPL wird insbesondere in Deutschland und Schweden intensiv genutzt, da Klarna in diesen Ländern eine bedeutende Marktpresenz hat. In Tschechien ist die Zahlung per Nachnahme (Cash on Delivery) besonders beliebt.

Das Kapitel beleuchtet auch die bevorzugten Geräte für den E-Commerce: Desktop-PCs und Smartphones werden am häufigsten genutzt. Im Durchschnitt bevorzugen 59 % der Verbraucher Desktop-Geräte für Online-Einkäufe, gefolgt von Smartphones mit 48 %.

Frankreich und Deutschland führen beim Transaktionswert im E-Commerce, insbesondere über Desktop-Browser. Italien und Spanien weisen einen höheren Anteil mobiler Zahlungen auf. In Portugal und Schweden ist das Verhältnis zwischen Desktop- und Mobilzahlungen ausgewogen. Insgesamt ist der Transaktionswert von 70.078 Mio. EUR im Jahr 2018 auf 101.656 Mio. EUR im Jahr 2022 gestiegen, mit Prognosen für weiteres Wachstum.

Das Kapitel untersucht auch die mit verschiedenen Zahlungsmethoden verbundenen Kosten. Abgesehen von Karteninhabergebühren entstehen Verbrauchern in der Regel keine zusätzlichen Kosten bei der Nutzung von Kreditkarten, Debitkarten, Überweisungen, Lastschriften oder digitalen Wallets. Händler hingegen tragen Transaktionsgebühren, die je nach Zahlungsmethode, Anbieter und regulatorischem Rahmen (z. B. EU-Verordnung zu Interbankenentgelten) variieren – als fester Betrag oder prozentualer Anteil am Transaktionswert. Zahlungsdienstleister setzen verschiedene Geschäftsmodelle ein, darunter provisionsbasierte Modelle, Freemium-Angebote und Abonnements.

Abschließend liefert das Kapitel eine Schätzung des von internationalen Kartensystemen (ICS) im E-Commerce über digitale Wallets generierten Geschäftsvolumens. Die Ergebnisse geben einen ungefähren Einblick in die Rolle von ICS und digitalen Wallets im Online-Handel. Trotz länderspezifischer Unterschiede deuten die Schätzungen darauf hin, dass etwa 27,6 % der ICS-Transaktionen über digitale Wallets abgewickelt werden.

## Kapitel 2 – Positionierung und Verbraucherentscheidungen

Ziel dieses Kapitels ist es, Erkenntnisse über die Einflussfaktoren des Verbraucherverhaltens zu gewinnen, die in die wettbewerbsrechtliche Analyse einfließen. Im Fokus stehen dabei sowohl direkte Faktoren – also solche, die mit den Eigenschaften der Plattform oder der Zahlungsmethode zusammenhängen – als auch indirekte Faktoren, die sich auf das Umfeld oder individuelle Merkmale beziehen.

Das Kapitel konzentriert sich in erster Linie auf direkte Faktoren und analysiert im Detail drei Anzeigepraktiken für Zahlungsmethoden, die das Verbraucherverhalten bei der Wahl der Zahlungsmethode beeinflussen können: a) Up-Streaming, b) Standardoption (Default Option) und c) „Mehr anzeigen“-Funktion (Show-More). Gleichzeitig wird auch den indirekten Faktoren große Aufmerksamkeit geschenkt, da diese als Verstärker für die genannten Praktiken wirken können.

Vier Maßnahmen zur Datenerhebung wurden genutzt, um die Perspektive der Verbraucher abzubilden und die Robustheit der Analyse zu gewährleisten:

Ausgangspunkt der Datenerhebung war eine umfassende Literaturrecherche. Diese diente dazu, ein theoretisches Modell zu entwickeln, das die verschiedenen Einflussfaktoren auf die Wahl der Zahlungsmethode abbildet. Aufbauend auf diesen Erkenntnissen wurde eine Mystery-Shopping-Analyse durchgeführt, um die auf dem Markt gängigen Anzeigepraktiken sowie deren konkrete Umsetzung zu erfassen. Auf Basis der so gewonnenen Einsichten wurde eine groß angelegte Verbraucherumfrage konzipiert, die Aufschluss über die Gewohnheiten und Einstellungen europäischer Konsumenten im Hinblick auf Online-Zahlungen gibt. Ergänzend dazu fand ein verhaltens-basiertes Experiment statt, bei dem die Teilnehmenden eine Einkaufssituation auf einer simulierten E-Commerce-Plattform durchliefen. Ziel dieses

Experiments war es, die Wirkung unterschiedlicher Anzeigepraktiken auf die Zahlungsentscheidungen der Nutzer zu testen.

Das Mystery Shopping, die Verbraucherumfrage und das Verhaltensexperiment wurden in 14 Mitgliedstaaten durchgeführt, wobei für die Umfrage und das Experiment jeweils die Landessprache verwendet wurde.

Zur Analyse wurden deskriptive Statistiken, eine Segmentierung basierend auf den Zahlungsmethodenportfolios der Nutzer sowie zwei multivariate Regressionsanalysen eingesetzt. Letztere dienten dazu, einflussreiche Faktoren zu identifizieren, die den Effekt von Anzeigepraktiken verstärken – z. B. Kaufpreis oder verwendetes Gerät – sowie die typischen Merkmale der einzelnen Nutzersegmente zu bestimmen.

Insgesamt zeigen die Datenanalysen und Regressionsmodelle, dass die untersuchten Anzeigepraktiken das Verbraucherverhalten messbar beeinflussen. Laut Experimentdaten hatte die „Show-More“-Option den stärksten Einfluss: Rund 80 % der Teilnehmer wichen von ihrer ursprünglich gewählten Zahlungsmethode ab. Die „Standardoption“ führte bei 22 % und „Up-Streaming“ bei 15 % der Teilnehmenden zu einem Methodenwechsel. Insgesamt neigten die Teilnehmenden stärker dazu, die Zahlungsmethode zu wechseln, wenn durch die Anzeigepraktik der Kaufkomfort verringert wurde (z. B. zusätzliche Klicks durch „Show-More“) – weniger jedoch, wenn dieser erhöht wurde.

Darüber hinaus zeigt die Umfrage, dass die Wirkung dieser Praktiken nicht nur von deren Art abhängt, sondern auch vom jeweiligen Nutzer und der Entscheidungssituation. Die Anzahl und Art der verfügbaren Zahlungsmethoden, die Offenheit für neue Technologien sowie der Grad der Digitalisierung beeinflussen die Wirkung. Zudem wirken Anzeigepraktiken besonders effektiv bei vertrauten E-Commerce-Plattformen und bei eher alltäglichen, günstigeren Käufen – was auf schnelle, intuitive Entscheidungsprozesse hinweist.

Auf Grundlage dieser Erkenntnisse ist klar, dass Anzeigepraktiken von E-Commerce-Plattformen oder Zahlungsdienstleistern genutzt werden können, um die Wahl der Zahlungsmethode durch Verbraucher zu beeinflussen.

### Kapitel 3 – Intensität des Wettbewerbs

Die Beziehungen zwischen Anbietern von Zahlungsmethoden können sowohl horizontaler als auch vertikaler Natur sein. Kartensysteme beispielsweise liefern einerseits eine Infrastruktur für digitale Geldbörsen, stehen aber gleichzeitig in direkter Konkurrenz zu diesen auf der Bezahlseite von E-Commerce-Plattformen.

Stakeholder, die an unserer Konsultation teilgenommen haben, deuten darauf hin, dass Anbieter unterschiedlicher Zahlungsmethoden oder auf unterschiedlichen Zahlungsdiensten basierender Systeme einander als enge Wettbewerber wahrnehmen. Internationale Kartensysteme sehen sich unter anderem durch lokale Systeme und Anbieter digitaler Geldbörsen unter Wettbewerbsdruck. Umgekehrt empfinden auch nationale Systeme und Konto-zu-Konto-Zahlungslösungen (A2A) die internationalen Kartensysteme als Konkurrenz. Ebenso stehen kartenbasierte und nicht-kartenbasierte Zahlungsmethoden miteinander im Wettbewerb.

Ein rein aggregierter Blick kann jedoch die tatsächliche Wettbewerbsstärke einzelner Marktteilnehmer verdecken – ebenso wie potenzielle Wettbewerbsbeschränkungen.

Dieses Kapitel untersucht die Wettbewerbsparameter anhand der Bestimmungsfaktoren für die Wahl von Zahlungsmethoden durch Konsumenten sowie der Akzeptanz seitens der Händler. Zu-dem wird beleuchtet, welchen Einschränkungen Anbieter unterliegen, wenn sie ihr Angebot auf neue Zahlungsmethoden ausweiten wollen.

Die Nachfrage der Verbraucher und die Akzeptanz der Händler stehen in einem engen Zusammenhang. Online-Zahlungsplattformen sind zweiseitige Märkte, die von indirekten Netzwerkeffekten geprägt sind: Je mehr Konsumenten eine Zahlungsmethode verwenden, desto eher sind Händler bereit, diese zu akzeptieren – und umgekehrt steigt für Konsumenten der Nutzen, je mehr Händler sie akzeptieren.

Zu den wichtigsten Faktoren für Konsumenten bei der Entscheidung für eine neue Zahlungsmethode zählen das Fehlen von Transaktionskosten, Sicherheitsmerkmale, der Ruf des Anbieters so-wie die Benutzerfreundlichkeit. Einige dieser Faktoren – insbesondere Benutzerfreundlichkeit und Sicherheitswahrnehmung – verstärken sich mit zunehmender Nutzung und festigen dadurch die Präferenzen der Konsumenten und indirekt auch die Akzeptanz durch Händler. Händler wiederum passen ihr Zahlungsangebot an die erwarteten Präferenzen ihrer Kunden an, um die Reichweite zu maximieren und Kaufabbrüche zu minimieren. Auch Kostenüberlegungen spielen eine wichtige Rolle.

Vertragliche Vereinbarungen mit Zahlungsdienstleistern können Händler dazu verleiten, Verbraucher gezielt zu Zahlungsoptionen zu lenken, die für sie wirtschaftlich vorteilhafter sind. Das im Kapitel 2 beschriebene Verhaltensexperiment legt nahe, dass Händler durch bestimmte Anzeigepraktiken die Auswahl der Zahlungsmethoden beeinflussen könnten. Gleichzeitig zeigt die Umfrage, dass Verbraucher häufig zögern, sich für neue Zahlungsmethoden zu registrieren. Auch wenn viele mehrere Zahlungsmethoden besitzen, nutzen die meisten regelmäßig nur ein oder zwei. Diese Erkenntnisse deuten darauf hin, dass Händler die Akzeptanz von Zahlungsmethoden sorgfältig abwägen müssen, um Abbruchraten beim Checkout gering zu halten und gleichzeitig die Kosten zu kontrollieren. Viele Händler bieten daher mehrere Zahlungsmöglichkeiten an – laut Umfrage im Durchschnitt knapp acht.

Die Konsultation mit Stakeholdern offenbarte zudem verschiedene Hürden, die einen Wechsel zwischen Zahlungsmethoden erschweren können – etwa grenzüberschreitende Expansion, Aufbau eines Bank- oder Dienstleisternetzwerks in anderen Mitgliedstaaten, Händlerakzeptanz, Markenbekanntheit oder technische Integration mit anderen Zahlungsdiensten. Sofern unterschiedliche Zahlungsmethoden dieselben Bedürfnisse von Händlern und Konsumenten bedienen, können solche Hindernisse Reibung erzeugen und den Wettbewerbsdruck zwischen Anbietern verringern.

#### Kapitel 4 – Potenzielle Wettbewerbsbedenken im Online-Zahlungsverkehr

Diese Studie zielt darauf ab, einen Rahmen für die Bewertung potenzieller Praktiken bereitzustellen, die den Wettbewerb im Bereich der Online-Zahlungen verfälschen könnten. Sie konzentriert sich dabei insbesondere auf die Rolle bestimmter Marktakteure: internationaler Kartensysteme (ICS), Big-Tech-Unternehmen, Banken und PayPal.

##### Die Rolle der internationalen Kartensysteme (ICS)

Trotz jüngerer Entwicklungen werden Karten im Online-Zahlungsverkehr weiterhin stark genutzt – sowohl direkt als auch über digitale Wallets. Visa und Mastercard nehmen dabei eine besonders dominante Stellung ein. Schätzungen von Capgemini zeigen, dass der Mediananteil von Visa an den E-Commerce-Transaktionen in 11 von 14 untersuchten Ländern bei 45 % liegt, jener von Mastercard bei 53 %.

Laut der Verbraucherumfrage besitzen durchschnittlich 64 % der Befragten in den untersuchten Ländern eine Zahlungskarte – zusammen mit Paypal die verbreitetste Methode. 96 % dieser Karteninhaber nutzen eine Karte der Marken Visa, V-Pay, Mastercard oder Maestro.

Entsprechend betrachten Händler ICS-Karten als unverzichtbar – ein Ergebnis mit weitreichenden Implikationen für den Wettbewerb. Ein Teil der Nachfrage ist für

Wettbewerber praktisch nicht angreifbar, da Verbraucher Visa- oder Mastercard-Karten unabhängig vom übrigen Angebot bevorzugen.

Visa und Mastercard fungieren somit als unverzichtbare Partner für unterschiedliche Marktakteure: Händler, Acquirer und Zahlungsdienstleister (PSPs), Kartenherausgeber (Banken und Neobanken) sowie Anbieter von Zahlungs-Apps (z. B. digitale Wallets), die auf deren Infrastruktur basieren.

Angesichts ihrer starken Marktstellung könnten bestimmte Verhaltensweisen der ICS dazu führen, ihre Position weiter zu verfestigen und den Wettbewerb zu verzerren. Dieses Kapitel zielt nicht darauf ab, solche Praktiken abschließend als wettbewerbswidrig zu bewerten, sondern einen analytischen Rahmen zu liefern. Zu den potenziell problematischen Verhaltensweisen zählen:

- Gebührenerhöhungen für Acquirer (und damit indirekt für Händler), ohne signifikanten Nachfragerückgang aufgrund der starken Marktstellung;
- Exklusivitätsklauseln in Verträgen mit Acquirern oder direkt mit Händlern (selten), die die Annahme konkurrierender Zahlungsmethoden vorschreiben oder Anreize dafür schaffen;
- Vereinbarungen über bevorzugte Platzierung von ICS-Zahlmethoden – z. B. durch prominente Darstellung auf Bezahlseiten oder Vorrang bei Co-Badging Zahlungen – unterstützt durch digitale Wallets oder Händler. Ergebnisse des Verhaltensexperiments deuten darauf hin, dass solche Display-Praktiken insbesondere bei Kartenzahlungen wirksam sein können.

Wettbewerbsbehörden anderer Länder haben geprüft, ob ICS sogenannte Mengennachlässe gewähren könnten: Händler und Acquirer erhalten finanzielle Anreize ab bestimmten Umsatzschwellen – ohne vertragliche Verpflichtung zur bevorzugten Behandlung, aber mit ähnlichem Effekt.

Wenn der Abschluss solcher Vereinbarungen notwendig ist, um mit ICS zusammenzuarbeiten, oder wenn Wettbewerber solche Anreize nicht bieten können, könnte dies dazu führen, dass alternative Zahlungsanbieter – etwa andere internationale oder nationale Kartensysteme sowie nicht-kartenbasierte Methoden – keine ausreichende Marktgröße erreichen, um wettbewerbsfähig zu bleiben.

ICS spielen auch für digitale Wallets großer Technologieunternehmen eine Schlüsselrolle. Daraus ergibt sich potenziell eine enge Verflechtung, die die Ausrichtung der Wallets beeinflussen kann – etwa zugunsten von Kartenlösungen gegenüber alternativen Zahlungssystemen. Zudem könnten ICS Wallet-Anbieter ermutigen, ihre Netzwerke gegenüber anderen bevorzugt zu behandeln, ins-besondere bei Co-Badging Karten.

Digitale Wallets der Big Techs sind für ICS besonders attraktiv – durch ihre großen Nutzerzahlen bieten sie sowohl Marktmacht als auch Expansionspotenzial. Auch wenn diese Wallets aktuell kartenzentriert sind, könnten sie durch Entwicklung alternativer Zahlungssysteme zu direkten Wettbewerbern der ICS werden. Wettbewerbsbehörden in anderen Jurisdiktionen untersuchen derzeit Hinweise auf strategische Vereinbarungen zwischen ICS und Big Techs, die den Wettbewerb durch alternative Zahlungssysteme behindern könnten.

Abschließend beschreibt Kapitel 4 detailliert, wie solche Vereinbarungen in der Praxis ausgestaltet sein könnten und welche Auswirkungen sie auf den Wettbewerb im Bereich Online-Zahlungen hätten.

### Die Rolle der Banken

Emittierende Banken spielen eine bedeutende Rolle im Bereich der Online-Zahlungen, indem sie Überweisungen, Lastschriften und kartenbasierte Zahlungen ermöglichen. Sie

sind auch an Konto-zu-Konto-Zahlungslösungen (A2A) beteiligt und bieten häufig eigene Anwendungen in Zusammenarbeit mit anderen Banken an. In mehreren europäischen Ländern haben Banken beispielsweise beliebte lokale A2A-Lösungen wie iDEAL, Blik, Bizum und andere entwickelt. Diese Initiativen bleiben oft regional begrenzt, da sie technische und kommerzielle Unterstützung durch Banken erfordern. In jüngerer Zeit haben sich Banken zusammengeschlossen, um grenzüberschreitende Lösungen wie EPI/Wero und das EuroPA-Projekt zu entwickeln.

Während diese Kooperationen eine Herausforderung für etablierte globale Akteure darstellen könnten, können sie auch wettbewerbsrechtliche Bedenken aufwerfen – insbesondere dann, wenn sie durch abgestimmte Verhaltensweisen den Wettbewerb einschränken.

Interessenträger äußerten die Sorge, dass Banken Drittanbieter von Zahlungsdiensten (PISPs) behindern könnten, indem sie minderwertige APIs bereitstellen, die Anzahl der Zahlungen begrenzen oder zusätzliche Gebühren für Überweisungen über unabhängige Drittanbieter erheben. Die von den an der Konsultation beteiligten Interessenträger bereitgestellten Informationen deuten außerdem darauf hin, dass dieses Verhalten unter anderem dadurch motiviert sein könnte, dass Banken ihre eigenen Zahlungslösungen unterstützen wollen.

Kapitel 4 befasst sich mit der Frage, inwieweit diese Praktiken unter dem EU-Wettbewerbsrecht Bedenken hervorrufen könnten.

### Die Rolle der Big Techs

Unsere Konsultation mit den Interessenträgern, obwohl sie auf einer begrenzten Anzahl von Antworten basiert, zeigt, dass digitale Geldbörsen (Wallets) von Big-Tech-Unternehmen von Händlern zunehmend als unverzichtbar angesehen werden. Ein relevanter Anteil von ihnen (7 von 18 befragten Online-Händlern) betrachtet die digitalen Wallets der Big Techs als „Must-have“-Lösungen für ihr Online-Geschäft. Die meisten von ihnen nannten speziell Apple Pay als eine unverzichtbare Zahlungsmethode.

Der europäische Online-Zahlungsmarkt hat sich durch den Eintritt und die Expansion von Big-Tech-Unternehmen erheblich gewandelt – angetrieben durch die wachsende Nachfrage der Verbraucher nach Komfort, Sicherheit und nahtlosen Transaktionserlebnissen.

Die Gründe für das schnelle Wachstum der Wallets von Big Techs – insbesondere Apple Pay und Google Pay – sind vielfältig. Zunächst werden digitale Wallets beim Online-Shopping auf mobilen Geräten häufig genutzt, da sie als komfortabler und sicherer im Vergleich zu physischen Karten wahrgenommen werden – ein Trend, der laut der in Kapitel 2 dargestellten Verbraucherumfrage in 13 von 14 Mitgliedstaaten beobachtet wird. Big Techs sind somit gut positioniert, um diesen Trend auszunutzen und ihren Einfluss weiter auszubauen. Zudem verschafft die Integration der Wallets in größere Ökosysteme ihnen einen entscheidenden Wettbewerbsvorteil. Apple Pay und Google Pay ermöglichen eine nahtlose Integration von Zahlungskarten über physische und digitale Kanäle hinweg. Das macht sie für Verbraucher attraktiver und trägt zum wachsenden Popularität bei – oft zum Nachteil von eigenständigen Wettbewerbern. Ein weiterer Vorteil der Wallets von Big Techs ist deren wahrgenommene Sicherheit und Benutzerfreundlichkeit – insbesondere im Vergleich zu herkömmlichen Debit- oder Kreditkarten – was sowohl aus der Verbraucherumfrage als auch der Händlerbefragung hervorgeht.

Big Techs könnten ihre Marktstellung in nicht-finanziellen Bereichen nutzen, um ihre Position im Finanzdienstleistungssektor auszubauen. Dies könnte anderen Marktteilnehmern den Zugang erschweren, proprietäre Lösungen bevorzugen, Abhängigkeiten schaffen und letztlich den Wettbewerb beeinträchtigen.

Zunächst ergab die Konsultation, dass es Bedenken hinsichtlich potenzieller Zugangsbeschränkungen durch Big-Tech-Plattformen gibt. Sie könnten Bedingungen für den Zugang zu ihren Plattformen auferlegen oder den Zugang ganz verweigern. Dafür hätten sie dann einen Anreiz, wenn durch die Verdrängung von Wettbewerbern im Online-Zahlungsbereich ihre Gewinne im Zahlungsverkehr steigen, ohne dass sie signifikante Verluste in ihren vertikal integrierten Märkten (z. B. Betriebssysteme oder App-Stores) hinnehmen müssten.

Eine weitere potenzielle Sorge ist die umfangreiche Datennutzung durch Big Techs. Diese verfügen durch ihre digitalen Plattformen über beispiellosen Zugang zu Nutzerdaten. Sie könnten diese Daten verwenden, um entweder Partnerschaften mit etablierten Akteuren einzugehen, Datenanalysen oder Cloud-Dienste zu verkaufen oder eigene Online-Zahlungsmethoden direkt anzubieten. Diese Integration von Zahlungsdaten in breitere digitale Ökosysteme stärkt nicht nur ihre Wettbewerbsposition, sondern ermöglicht es ihnen auch, im Vergleich zu traditionellen Finanzinstituten einen höheren Mehrwert zu generieren. Sie verbessert die Nutzererfahrung auch im Bereich der Online-Zahlungen und schafft Abhängigkeiten, die ihre Rolle in diesem Sektor weiter festigen. Unsere Konsultation offenbarte gewisse Bedenken bezüglich der Möglichkeit, dass Big Techs die durch ihre Ökosysteme gesammelten Daten ausnutzen könnten. Die vollständigen Auswirkungen dieser umfangreichen Datennutzung auf den Online-Zahlungsverkehr sind bisher noch nicht abschließend bewertet worden. Es ist jedoch wahrscheinlich, dass Big Techs diese Daten nutzen, um ihr Kerngeschäft – etwa Suchmaschinen, soziale Medien oder Online-Marktplätze – zu optimieren, indem sie tiefere Einblicke in die Gewohnheiten, Bedürfnisse und Vorlieben einzelner Kunden gewinnen.

Schließlich könnten einige Strategien darauf abzielen, durch Bevorzugung proprietärer Zahlungsmethoden Abhängigkeiten zu schaffen. Big Techs könnten durch ihre dominierende Stellung in Bereichen wie sozialen Medien oder App-Stores ihren eigenen Zahlungslösungen gegenüber Konkurrenzlösungen eine bevorzugte Darstellung einräumen – sowohl auf ihren eigenen Plattformen als auch auf Online-Shops Dritter, indem sie ihre große Nutzerbasis nutzen, um vorteilhaftere Präsentationen auszuhandeln.

Die Konsultationen mit Händlern und Anbietern von Zahlungsanwendungen deuten darauf hin, dass es tatsächlich bevorzugte Darstellungspraktiken zugunsten der Zahlungsdienste von Big Techs sowohl auf deren eigenen Geräten/Plattformen als auch auf Drittanbieterplattformen gibt. Diese Praktiken könnten entweder aus vertraglichen Vereinbarungen zwischen Big Techs und Händlern resultieren oder aus plattformseitig auferlegten Einschränkungen (z. B. durch APIs).

Eine verwandte Praxis ist das Bundling (Kopplung von Diensten), bei dem Big Techs die Vorlieben der Verbraucher für Dienste, in denen sie marktbeherrschend sind, nutzen, um ihre Zahlungslösungen zu fördern. Aus der Konsultation geht hervor, dass es im Online-Zahlungsbereich Bedenken gibt, dass Big Techs ihre Marktmacht in Bereichen wie Betriebssystemen, Online-Werbung oder App-Vertrieb ausnutzen könnten, um die Nutzung ihrer eigenen Zahlungsdienste zu fördern oder sogar vorauszusetzen. Dies könnte den Wettbewerb beeinträchtigen, indem alternative Zahlungsmethoden weniger sichtbar und weniger attraktiv erscheinen, was letztlich die Auswahlmöglichkeiten der Verbraucher einschränkt. Darüber hinaus könnte Bundling auch dazu verwendet werden, andere Zahlungsdienstleister dazu zu zwingen, sich in die Infrastruktur von Big Techs zu integrieren oder von ihr abhängig zu werden, um weiterhin auf diesen Plattformen verfügbar zu sein. Dies würde den Einfluss von Big Techs auf das digitale Zahlungssystem weiter verstärken. Aus solchen Gründen untersuchen Wettbewerbsbehörden in anderen Rechtsräumen das Verhalten von Big Techs im Online-Zahlungsbereich besonders genau.

## Die Rolle von Paypal

Neben ICS, Banken und Big-Tech-Unternehmen ist Paypal seit Jahren ein erfolgreicher Akteur im Zahlungsverkehr und erfasst heute einen erheblichen Anteil an E-Commerce-Transaktionen in Ländern wie Österreich, Deutschland, Italien und Spanien.

Die im Rahmen der Konsultation befragten Händler stuften Paypal als „Must-have“-Zahlungsmethode für ihren Browser, ihre App oder beides ein. Die Ergebnisse der Verbrauchenumfrage bestätigen die Beliebtheit von Paypal unter den Nutzern im Europäischen Wirtschaftsraum (EWR): 65 % der Befragten gaben an, ein Paypal Konto zu besitzen – ein Anteil, der mit dem von Karten vergleichbar ist. In Österreich, Deutschland, Italien und Spanien liegt dieser Anteil so-gar noch höher.

Paypal hat seine Position im Markt für Online-Zahlungen wahrscheinlich durch seinen First-Mover-Vorteil, seine Vertrauenswürdigkeit und die strategische Nutzung eines zweistufigen Wallet-Systems behaupten können. Der frühe Markteintritt im Jahr 2004, die Übernahme durch eBay und die P2P-Funktionalität (Person-to-Person) trugen zum rasanten Wachstum bei.

In den letzten Jahren hat Paypal jedoch an Popularität verloren – möglicherweise zugunsten von Wallets der Big Techs, insbesondere Apple Pay.

Der Rückgang von Paypal lässt sich auf mehrere zentrale Faktoren zurückführen. Ein wesentlicher Grund ist, dass Verbraucher zunehmend nahtlose, datenschutzfreundliche Checkout-Erlebnisse bevorzugen, während Paypals komplexe Identitätsprüfung und Kontoerstellung diesen Erwartungen entgegenstehen. Im Jahr 2018 verlagerte eBay seine Zahlungsabwicklung zu Adyen – einer nahtloseren Alternative –, was wahrscheinlich zu einem Vertrauensverlust gegenüber Paypal beitrug. Zudem stellen Big-Tech-Unternehmen wie Apple Pay und Google Pay mit ihren ausgeprägten Netzwerkeffekten, großen Nutzerbasen und fortschrittlichen Technologien eine erhebliche Konkurrenz für Paypal dar.

Ein weiterer Faktor ist, dass Paypal hauptsächlich auf den Online-Markt beschränkt bleibt, während mobile Zahlungslösungen der Big Techs den Verbrauchern durch NFC-basierte kontaktlose Zahlungen einen höheren Komfort bieten – eine Funktion, die zunehmend geschätzt wird. Darüber hinaus hat der Aufstieg neuer Zahlungsmethoden wie A2A-Lösungen und BNPL den Wettbewerbsdruck verstärkt.

In diesem Kontext könnte Paypal versucht haben, seine Marktposition durch bestimmte Maßnahmen zu sichern – etwa durch bevorzugte Darstellung eigener Zahlungsmethoden. Inwieweit solche Maßnahmen, sofern sie überhaupt stattfinden, den Wettbewerb verzerren können, hängt vom jeweiligen Marktanteil ab. Und dieser wiederum ist abhängig vom „Must-have“-Status von Paypal – ein Faktor, der sich je nach Land unterscheiden kann.

## Résumé analytique

L'évolution rapide des moyens de paiements en ligne influe sur les dynamiques concurrentielles et oblige les autorités de la concurrence à se tenir au fait des développements technologiques pertinents et des nouveaux modèles économiques qui émergent dans ce secteur. Cette étude analyse de manière méthodique le secteur des paiements en ligne dans l'EEE en fournissant de nouvelles données sur la valeur et le volume des transactions des principaux moyens de paiement en ligne, en évaluant les dynamiques concurrentielles s'opérant entre eux et en analysant les pratiques qui risquent de favoriser ou de renforcer la position des opérateurs historiques.

L'étude s'appuie sur une triangulation de sources d'information diverses, incluant l'analyse des données quantitatives, une enquête auprès des consommateurs et une consultation des acteurs du secteur. Elle couvre quatorze pays de l'EEE : Autriche, République tchèque, Danemark, France, Allemagne, Hongrie, Grèce, Italie, Lettonie, Pays-Bas, Pologne, Portugal, Espagne et Suède sur la période 2018- 2022.

Les consommateurs effectuent leurs achats en ligne (e-commerce et m-commerce) au travers de divers appareils, notamment mobiles (smartphones, objets connectés, tablettes) et non mobiles (ordinateurs, cartes). Ces appareils hébergent des applications qui facilitent les paiements, comme Apple Pay sur iPhone ou les cartes-cadeaux dans les applications marchandes. Ces applications utilisent différents services de paiement, tels que les prélèvements automatiques, les virements bancaires, les paiements par carte et la monnaie électronique disponible à l'échelle de la zone SEPA.

Aux fins de cette étude, un "moyen de paiement en ligne" est défini comme une combinaison de ces appareils, applications et services de paiement. Les moyens de paiement en ligne examinés dans cette étude comprennent les transactions par carte de crédit et de débit, les virements bancaires, les transferts de compte à compte et les portefeuilles numériques.

Les données recueillies - corroborées par des données qualitatives fournies par l'enquête auprès des consommateurs et la consultation des acteurs du secteur - sont utilisées pour analyser de manière méthodique les moyens de paiement en ligne pertinents dans l'EEE et leur évolution au cours des 5 dernières années. L'enquête auprès des consommateurs recueille des informations sur les déterminants du comportement des consommateurs concernant les transactions en ligne et explore l'efficacité des pratiques d'affichage pour influencer les choix des consommateurs. Enfin, la consultation des acteurs du secteur a permis de recueillir les perspectives des acteurs clés du secteur des paiements en ligne, y compris des systèmes internationaux de cartes, des grandes entreprises technologiques, des grands et petits commerçants, des banques émettrices, des moyens de paiement émergents et des portefeuilles numériques historiques.

Le secteur des paiements en ligne est intrinsèquement caractérisé par certaines particularités structurelles qui contribuent à élever les barrières à l'entrée et/ou à l'expansion pour des acteurs du secteur. Les effets de réseau, d'image de marque, des normes technologiques très complexes et coûteuses font de la taille un facteur crucial pour être compétitif dans ce secteur. Les dynamiques économiques découlant de ces caractéristiques structurelles ont conduit à la concentration d'une part importantes de l'offre entre les mains d'acteurs bien établis dans l'industrie, en particulier des systèmes internationaux de cartes (SCI) et Paypal, dans plusieurs États membres, malgré les changements récents et l'évolution des dynamiques concurrentielles.

L'étude montre que les cartes de crédit et de débit sont largement utilisées dans l'EEE et que, malgré les récentes évolutions du secteur, elles maintiennent une position forte au sein des pays sélectionnés. Bien que les portefeuilles numériques prennent de plus en plus d'importance, cela pourrait renforcer davantage la position des cartes, et plus spécifiquement des SCI. Cette croissance a été stimulée par la notoriété croissante des

portefeuilles numériques proposés par les grandes entreprises technologiques (Apple Pay, Google Pay, Amazon Pay). Malgré la présence de longue date de Paypal dans l'EEE, son utilisation diminue dans certains pays. Les services d'initiation de paiement (PIS) et les solutions acheter maintenant, payer plus tard (BNPL) gagnent du terrain, en particulier en Pologne, aux Pays-Bas et dans les pays nordiques, mais restent marginaux dans les autres pays analysés.

Étant donné les caractéristiques structurelles du secteur, il est important que l'application des règles de concurrence soit suffisamment souple afin de faire face aux comportements susceptibles de fausser la concurrence, avant qu'il ne soit plus difficile de lutter contre leurs effets et que la position des opérateurs historiques sur le marché ne devienne de plus en plus ancrée. À cette fin, la présente étude vise à fournir un cadre permettant d'évaluer les pratiques potentielles susceptibles de poser problème au regard du droit de la concurrence européenne.

Bien que la triangulation des diverses sources ayant alimenté cette étude – données quantitatives, recherche documentaire, enquête auprès des consommateurs, consultation des acteurs du secteur – ne vise pas à identifier de manière concluante l'existence d'un comportement anticoncurrentiel, les informations collectées jouent un rôle essentiel dans la compréhension des incitations des acteurs du secteur et des effets potentiels des comportements tirant parti d'un pouvoir de marché.

Le reste de ce résumé donne un aperçu de la méthodologie et des résultats de chaque chapitre, en discutant des principales informations quantitatives fournies dans le chapitre 1, de l'enquête auprès des consommateurs sur les habitudes et les attitudes des Européens concernant les paiements en ligne du chapitre 2, des principales dynamiques concurrentielles au chapitre 3 et des sources potentielles de préoccupations sur le plan concurrentielle présentées dans le chapitre 4.

## Chapitre 1 - Aperçu du marché

Le chapitre 1 présente de nouvelles données sur la structure et l'évolution du secteur des paiements en ligne dans l'EEE. Étant donné l'absence de normes communément acceptées pour rapporter les volumes et les valeurs des transactions de paiement en ligne, il établit également des définitions clés et une taxonomie qui seront utilisées de manière cohérente tout au long du rapport, y compris dans l'analyse concurrentielle et l'expérience comportementale de la présente étude.

Les données sont basées sur le rapport E-Commerce Analytics de GlobalData, qui fournit la valeur des transactions du commerce électronique, des détails sur les paiements fait au travers des différents moyens de paiement en ligne et des données sur les paiements dans des applications mobiles. La base de données ainsi générée repose sur une recherche documentaire approfondie.

Les principales conclusions révèlent que les cartes de crédit se classent systématiquement parmi les méthodes de paiement les plus utilisées dans tous les pays analysés, à l'exception de la Hongrie, la Pologne et le Portugal, où les cartes de débit ont une part plus élevée. Plus précisément, la France, la Grèce et l'Espagne connaissent une part de valeur du commerce en ligne plus élevée en faveur des cartes de crédit. À l'inverse, l'Espagne, la Grèce et le Portugal ont la part de valeur la plus élevée en faveur des cartes de débit.

L'utilisation des portefeuilles numériques varie, l'Italie et l'Allemagne montrant une préférence plus élevée pour les portefeuilles numériques dit à deux étapes par rapport aux portefeuilles numériques dit intermédiaires, principalement en raison de Paypal. Dans de nombreux autres pays, en revanche, l'utilisation des portefeuilles intermédiaires est plus élevée, ce qui peut être lié au fait qu'Apple Pay et Google Pay couvrent une part plus importante des transactions en ligne dans ces pays.

L'utilisation des services bancaires en ligne est en augmentation dans tous les pays analysés, et particulièrement en Pologne, au Portugal et aux Pays-Bas. Ces pays ont vu respectivement l'émergence de BLIK, MBWay et iDEAL, qui sont des acteurs nationaux et des applications et services de paiement populaires au niveau national.

L'option BNPL est largement utilisée en Allemagne et en Suède. Cela s'explique par l'importance de Klarna au niveau local. Le paiement à la livraison est particulièrement populaire en République tchèque.

Le chapitre met également en évidence les préférences des appareils utilisés pour le commerce électronique, les ordinateurs et les smartphones étant les plus préférés. En moyenne, 59 % des consommateurs préfèrent les ordinateurs pour les achats en ligne, suivis par les smartphones à 48 %.

La France et l'Allemagne sont en tête du classement des valeurs des transactions du commerce électronique, en particulier via les navigateurs de recherche sur ordinateur. L'Italie et l'Espagne quant à eux ont une part plus élevée de paiements en ligne via mobiles par rapport aux autres pays. Le Portugal et la Suède affichent un mélange équilibré de valeurs de transactions sur ordinateur et sur mobile. La valeur totale des transactions en ligne a régulièrement augmenté, passant de 70 078 millions d'euros en 2018 à 101 656 millions d'euros en 2022, avec des projections de croissance continue.

Le chapitre examine également les coûts associés aux différentes méthodes de paiement. Outre les frais liés à la possession d'une carte, les consommateurs n'encourent généralement pas d'autres coûts supplémentaires lors de l'utilisation des moyens de paiement en ligne, que ce soit avec les cartes de crédit, les cartes de débit, les virements, les prélèvements automatiques et les portefeuilles numériques. Cependant, les commerçants couvrent des frais de transaction qui peuvent aller d'un montant fixe à un pourcentage de la valeur de la transaction, qui dépendent de plusieurs facteurs tels que le moyen de paiement utilisé par le consommateur, le fournisseur de services du commerçant et les cadres réglementaires comme le règlement européen relatif aux commissions d'interchange pour les opérations de paiement liées à une carte. Divers modèles commerciaux sont employés par les prestataires de services de paiement, notamment des modèles basés sur des commissions, des abonnements ou freemium.

Enfin, ce chapitre estime les volumes commerciaux des transactions du commerce en ligne générés par les systèmes internationaux de cartes (SCI) via l'utilisation de portefeuilles numériques. Les résultats offrent des aperçus approximatifs du rôle des SCI et des portefeuilles numériques sur les marchés du commerce électronique. Bien qu'il y ait des variations significatives entre les pays, les estimations suggèrent que 27,6 % des transactions des SCI sont traitées via des portefeuilles numériques.

## Chapitre 2 - Positionnement et choix des consommateurs

L'objectif de ce chapitre était d'obtenir des informations sur les déterminants du comportement des consommateurs pour alimenter l'analyse concurrentielle. En particulier, il visait à explorer l'impact des effets directs sur les choix des moyens de paiement en ligne, liés aux caractéristiques de la plateforme de commerce électronique et des moyens de paiement disponibles, et des facteurs indirects, liés à l'environnement externe et aux attributs individuels des consommateurs.

Ce chapitre s'est principalement concentré sur les facteurs directs, en analysant en profondeur trois pratiques d'affichage des méthodes de paiement qui peuvent influencer la décision des consommateurs lorsqu'il s'agit de choisir un moyen de paiement. Il s'est ainsi concentré sur a) l'affichage en amont, b) l'option par défaut et c) le bouton "voir plus". Cependant, une attention particulière a également été accordée aux facteurs indirects, qui peuvent agir comme catalyseurs de ces pratiques.

Quatre activités de collecte de données ont été exploitées pour recueillir la perspective des consommateurs et assurer la robustesse des données utilisées.

Le point de départ de la collecte de données était une revue de la littérature existante sur ce sujet. Cette revue a été utilisée pour construire un modèle théorique cartographiant les différents facteurs influençant le choix du moyen de paiement en ligne. L'étude a ensuite été étendue par un exercice de « client mystère » afin d'explorer les différentes pratiques d'affichage mise en place sur le marché ainsi que les conditions dans lesquelles elles sont mises en œuvre. Sur la base des informations recueillies grâce à la revue et au client mystère, une enquête à grande échelle auprès des consommateurs a été menée pour recueillir leurs habitudes et les attitudes des Européens en matière de paiements en ligne. Cette enquête a été couplée à une expérience comportementale consistant en l'achat en ligne d'un produit sur une plateforme de commerce électronique fictive, créée pour l'expérience, dans le but de tester la capacité des pratiques d'affichage à orienter les consommateurs vers différents moyens de paiement.

Le client mystère, l'enquête auprès des consommateurs et l'expérience comportementale ont couvert 14 États membres. Les deux derniers exercices, ont chacun été traduits dans la langue du consommateur interrogé.

L'analyse a fait usage de statistiques descriptives, d'une segmentation basée sur le portefeuille des moyens de paiement des individus interrogés, et de deux régressions multivariées. Les régressions ont été utilisées pour déterminer les facteurs qui augmentent l'impact des pratiques d'affichage sur le choix des consommateurs de leur moyen de paiement, tels que les prix d'achat ou l'appareil utilisé. De plus, elles ont servi à comprendre les caractéristiques les plus courantes des différents segments de la population.

Dans l'ensemble, l'analyse des données et les régressions ont révélé que les pratiques d'affichage examinées ont un effet sur le choix des consommateurs. Selon les données de l'expérience, le bouton "voir plus" était la pratique d'affichage ayant le plus fort impact sur les consommateurs, avec environ 80 % des participants s'écartant de leur choix de paiement initial. L'option par défaut et l'affichage en amont étaient moins efficaces mais restent considérablement influents sur le choix du moyen de paiement utilisé, avec respectivement 22% et 15% des consommateurs changeant leur méthode de paiement lorsqu'ils sont exposés à ces pratiques d'affichage. En général, nous avons constaté que les pratiques d'affichage étaient plus susceptibles d'inciter les répondants à changer de méthode de paiement (par rapport à celle choisie dans la tâche 1 de l'expérience) lorsqu'elles diminuaient la commodité d'achat par rapport à lorsqu'elles l'augmentaient. Par exemple, lorsque des clics supplémentaires étaient ajoutés pour choisir un moyen de paiement (bouton "voir plus"), les consommateurs étaient plus susceptibles de passer à une méthode différente.

De plus, les données de l'enquête suggèrent que l'ampleur de l'impact de ces pratiques dépend non seulement de la pratique en elle-même, mais aussi de l'individu et du contexte dans lequel il prend la décision. En fait, les données et l'analyse ont révélé que le portefeuille (nombre et type) de moyens de paiement que les individus possèdent, ainsi que leur ouverture à la nouveauté et leur commodité avec le numérique, ont influencé l'ampleur des effets des pratiques analysées via l'expérience. Enfin, le fait que ces pratiques d'affichage soient plus efficaces sur les individus achetant sur des plateformes de commerce électronique qu'ils connaissent bien et sur des achats plus banals (moins chers) tend à démontrer leur dépendance à la prise de décision rapide.

Sur la base de ces informations, il est clair que les pratiques d'affichage peuvent être exploitées par les plateformes de commerce électronique ou les prestataires de services de paiement pour influencer le choix des consommateurs en matière de moyen de paiement en ligne.

### Chapitre 3 - L'intensité de la pression concurrentielle

Les relations entre les fournisseurs de méthodes de paiement peuvent être de nature horizontale et/ou verticale. Les systèmes de cartes, par exemple, peuvent fournir un intrant aux portefeuilles numériques, tout en les concurrençant sur la page de paiement des plateformes de commerce électronique.

Au travers de notre consultation, les acteurs du secteur suggèrent que les fournisseurs offrant différents moyens de paiement ou s'appuyant sur différents services de paiement se perçoivent mutuellement comme des concurrents proches. Les systèmes internationaux de cartes sont concurrencés notamment par les systèmes locaux et des acteurs locaux, ainsi que les fournisseurs de portefeuilles numériques. De même, les systèmes nationaux de cartes et les solutions de transfert de compte à compte (A2A) perçoivent une pression concurrentielle des systèmes internationaux de cartes. Enfin, les moyens de paiement basés sur les cartes et ceux qui ne sont pas dépendant d'une carte se perçoivent mutuellement comme concurrents.

Cependant, l'examen de ces ensembles de moyens de paiement peut masquer la force concurrentielle réelle de certains acteurs spécifiques et, éventuellement, les contraintes concurrentielles qui en découlent.

Ce chapitre étudie les caractéristiques de la concurrence qui s'opère dans ce secteur en examinant les déterminants du choix des consommateurs et de l'acceptation par les commerçants des divers moyens de paiement en ligne. De plus, il étudie les contraintes auxquelles les opérateurs sont confrontés dans leur capacité à étendre leur offre vers d'autres types de moyens de paiement.

La demande des consommateurs et l'acceptation des commerçants sont largement interdépendantes. Les plateformes de paiement en ligne sont des marchés bifaces, caractérisés par des effets de réseau indirects : plus les consommateurs utilisent un moyen de paiement, plus les commerçants seront disposés à l'accepter ; plus les commerçants acceptent un moyen de paiement, plus il a de valeur pour les consommateurs qui l'utilisent.

L'absence de frais de transaction, les caractéristiques de sécurité, la réputation des fournisseurs, la facilité d'utilisation sont parmi les dimensions les plus importantes que les consommateurs considèrent lors de l'inscription à un nouveau moyen de paiement. Certains de ces facteurs, à savoir la facilité d'utilisation et les perceptions de sécurité, ont tendance à augmenter avec l'usage, renforçant ainsi les préférences des consommateurs pour une méthode de paiement donnée, favorisant la réputation des fournisseurs et, à leur tour, l'acceptation par les commerçants. Les commerçants doivent leur offre de moyens de paiement acceptés aux préférences de leurs consommateurs, pour maximiser leur portée parmi les consommateurs et réduire les taux d'abandon en cours d'achat en ligne. Les considérations de coûts jouent également un rôle important auprès de commerçants.

Les arrangements contractuels avec les fournisseurs de méthodes de paiement peuvent encourager les commerçants à orienter les choix des consommateurs vers des options qui sont plus avantageuses économiquement pour eux. L'expérience comportementale du chapitre 2 suggère que les commerçants pourraient potentiellement exploiter les pratiques d'affichage pour influencer la sélection des moyens de paiement loin de la méthode préférée par le consommateur. Cependant, les résultats de l'enquête révèlent également que les consommateurs semblent réticents à s'inscrire à de nouveaux moyens de paiement. De plus, bien qu'ils puissent posséder plusieurs moyens de paiement, la plupart d'entre eux n'en utilisent fréquemment pas plus que deux. Tous ces éléments suggèrent que l'offre des moyens de paiement acceptés par les commerçants résulte d'une évaluation minutieuse de ces derniers, qui doivent s'assurer de minimiser les taux d'abandon en cours d'achat tout en contrôlant les coûts. Les

commerçants peuvent avoir tendance à accepter plusieurs moyens de paiement pour répondre aux préférences des consommateurs. Les acteurs sondés ont indiqué, par exemple, qu'ils offrent plusieurs méthodes de paiement, avec une moyenne de près de 8 options différentes.

Les consultations des acteurs du secteur révèlent plusieurs facteurs qui peuvent entraver le passage d'une méthode de paiement à une autre. Ces facteurs comprennent des défis tels que l'expansion transfrontalière, le développement d'un réseau suffisant de banques ou de prestataires de services de paiement dans d'autres États membres, assurer l'acceptation par les commerçants et la reconnaissance de la marque, et l'intégration avec divers services de paiement. Dans la mesure où différents moyens de paiement répondent aux mêmes besoins des consommateurs et des commerçants, ces facteurs peuvent créer des frictions, réduisant ainsi la pression concurrentielle qu'une méthode de paiement peut exercer sur une autre.

#### Chapitre 4 - Les sources potentielles des préoccupations concurrentielles dans le secteur des paiements en ligne

Cette étude vise à fournir un cadre afin d'évaluer les pratiques potentielles susceptibles de fausser la concurrence dans le secteur des paiements en ligne. Elle se concentre spécifiquement sur les SCI, les grandes entreprises technologiques (Big Tech), les banques et Paypal.

##### Le rôle des SCI

Malgré les récentes évolutions du marché, les cartes sont encore largement utilisées dans les secteurs des paiements en ligne, à la fois directement et par l'intermédiaire de portefeuilles numériques. Les systèmes internationaux de cartes, et en particulier Visa et Mastercard, ont un rôle particulièrement important. Les estimations de Capgemini indiquent que les valeurs médianes des parts de Visa et Mastercard dans les transactions du commerce électronique par carte sont de 45 % et 53 %, respectivement, dans 11 des 14 pays sélectionnés.

Les résultats de l'enquête auprès des consommateurs suggèrent que, en moyenne, 64% des consommateurs des pays analysés possèdent une carte de paiement, ce qui fait des cartes la méthode de paiement la plus répandue parmi les répondants, suivi de Paypal ; et que presque tous ces consommateurs (96% en moyenne dans les 14 pays sélectionnés) possèdent une carte avec l'une des marques Visa et Mastercard (Maestro, Mastercard, V-Pay, Visa).

De même, la grande majorité des commerçants interrogés considèrent les cartes SCI comme incontournables pour leurs affaires.

Ces derniers résultats ont des implications importantes dans la dynamique concurrentielle du secteur : il en résulte, en effet, qu'une part de la demande n'est pas disputable en faveur de Visa et Mastercard, c'est-à-dire que les consommateurs choisiront de payer par cartes Visa et Mastercard indépendamment des autres moyens de paiement disponibles.

Visa et Mastercard sont donc des "partenaires commerciaux" nécessaires pour la majorité des acteurs du secteur, notamment : i) les commerçants, ii) les acquéreurs et les prestataires de services de paiement (PSP), iii) les émetteurs (à la fois les banques et les néo-banques), iv) les fournisseurs d'applications de paiement qui utilisent l'infrastructure de ces systèmes de cartes (notamment les portefeuilles numériques).

Étant donné leur statut incontournable et leur fort pouvoir de négociation, il existe certaines pratiques qui - si elles sont mises en œuvre - pourraient ancrer le positionnement de Visa et Mastercard et altérer la concurrence dans le secteur des paiements en ligne. L'objectif de ce chapitre n'est pas d'identifier de manière concluante l'existence d'un comportement anticoncurrentiel, mais de fournir un cadre pour évaluer

les implications concurrentielles des comportements que les SCI pourraient potentiellement mettre en œuvre. Ces pratiques pourraient entraîner :

- des augmentations des frais que les acquéreurs (donc les commerçants) paient. La prévalence des SCI est telle qu'ils ne perdraient pas une part importante de la demande s'ils mettaient en œuvre de telles augmentations ;
- des accords avec les acquéreurs (ou directement avec les commerçants, bien que très rares) imposant ou incitant les acquéreurs ou les PSP (ou directement les commerçants) de ne pas accepter de méthodes de paiement concurrentes.
- des accords avec les acquéreurs (ou directement avec les commerçants, bien que très rares) imposant un traitement préférentiel des SCI par rapport à leurs rivaux, par exemple par un affichage plus favorable sur les plateformes des commerçants, ou par une priorisation de l'utilisation des SCI dans les transactions via cartes co-badgées par les commerçants et/ou les fournisseurs de portefeuilles numériques. Les résultats de l'expérience comportementale suggèrent que les pratiques d'affichage peuvent être efficaces surtout lorsqu'elles incitent les consommateurs à payer par carte.

Les autorités de la concurrence d'autres juridictions ont examiné la possibilité pour les SCI de proposer des régimes de rabais sur les volumes aux commerçants et à leurs acquéreurs ou PSP, par lesquels ces acteurs se voient accorder des facilités financières au-delà d'un certain seuil en termes de volumes de transaction. En échange de ces facilités, les SCI pourraient être en mesure d'obtenir un traitement préférentiel sans l'imposer contractuellement.

Dans la mesure où le respect de ces conditions est nécessaire pour contracter avec eux, ou que les facilités financières que les SCI accordent à leurs partenaires commerciaux ne sont pas reproductibles par les concurrents, ces pratiques - si elles sont mises en œuvre - pourraient nuire (i) aux autres systèmes internationaux de cartes, (ii) aux systèmes nationaux de cartes, (iii) aux fournisseurs de moyens de paiement alternatifs, non basés sur les cartes, en les privant d'une portée suffisante pour être compétitifs.

Les SCI jouent un rôle important pour les fournisseurs de portefeuilles numériques, y compris les grandes entreprises technologiques. Cette dynamique pourrait encourager les SCI à favoriser des relations plus étroites avec les portefeuilles numériques, influençant alors la portée de leurs partenariats avec d'autres systèmes de cartes ou orientant le développement de produits non basés sur les cartes. Les SCI peuvent également encourager les portefeuilles numériques à prioriser leurs réseaux, en particulier dans le cas des cartes co-badgées. Ces éléments, soutenus par le pouvoir de négociation des SCI, peuvent venir influencer le paysage concurrentiel des paiements en ligne.

Les portefeuilles numériques des grandes entreprises technologiques, avec leurs vastes bases d'utilisateurs, sont particulièrement attractifs pour les SCI. Leur présence sur le marché leur donne un avantage concurrentiel dans le secteur des portefeuilles numérique et représente une opportunité pour les SCI de renforcer leur position. Même s'ils s'appuient uniquement sur les cartes, ils pourraient devenir des concurrents potentiels des SCI en influençant le développement de systèmes de paiement alternatifs. Les autorités de la concurrence nationales ont notamment avancé le fait que les SCI pourraient avoir la capacité et les motivations nécessaires pour sécuriser des accords stratégiques avec les grandes entreprises technologiques visant à décourager les méthodes de paiement basées sur des moyens de paiement alternatifs pour gagner encore en importance.

Les autorités de la concurrence nationales ont également fait part de leurs préoccupations concernant la mise en œuvre potentielle de certaines des pratiques mentionnées ci-dessus par Visa et/ou Mastercard, bien que ces enquêtes n'en soient

encore qu'à leurs débuts. Notre consultation des acteurs du secteur suggère, bien que de manière limitée et non concluante, que certains d'entre eux craignent que les pratiques des SCI puissent s'aligner sur de telles pratiques.

Le chapitre 4 décrit en détail comment de tels accords pourraient être conçus en pratique et leurs effets potentiels sur la concurrence dans le domaine des paiements en ligne.

### Le rôle des banques

Les banques émettrices jouent un rôle important dans le domaine des paiements en ligne, en facilitant les virements, les prélèvements automatiques et les paiements par carte. Elles sont également impliquées dans les transferts A2A, offrant souvent leurs propres applications en collaboration avec d'autres banques. Par exemple, dans plusieurs pays européens, les banques ont développé des moyens de paiement A2A locaux populaires comme iDEAL, Blik, Bizum et d'autres. Ces initiatives restent souvent régionales en raison de la nécessité d'un soutien technique et commercial de la part des banques. Récemment, les banques se sont associées pour créer des moyens de paiement transfrontaliers, telles que EPI/Wero et le Projet EuroPA.

Bien que ces collaborations puissent venir défier les opérateurs historiques, elles peuvent également entraîner des préoccupations concurrentielles, notamment si elles mènent à la mise en place de pratiques coordonnées.

Les acteurs du secteur ont notamment exprimé leur préoccupation sur le fait que les banques puissent entraver les fournisseurs de services d'initiation de paiement (PISP) tiers en offrant des API de mauvaise qualité, en limitant le nombre de paiements ou en facturant des frais supplémentaires pour effectuer des virements via des fournisseurs tiers indépendants. Les informations fournies par les acteurs du secteur ayant participé à notre consultation suggèrent également que ce comportement peut être motivé, entre autres, par le fait que les banques veulent favoriser leurs propres moyens de paiement.

Le chapitre 4 examine dans quelle mesure ces pratiques pourraient soulever des problématiques au regard du droit de la concurrence européenne.

### Le rôle des grandes entreprises technologiques

Notre consultation des acteurs du secteur, bien que basée sur un nombre limité de répondants, révèle que les portefeuilles numériques proposés par les grandes entreprises technologiques sont de plus en plus considérés comme essentiels par les commerçants. Une part pertinente d'entre eux (7 sur 18 commerçants en ligne interrogés) considère les portefeuilles numériques des grandes entreprises technologiques comme des moyens de paiement "incontournables" pour leur activité en ligne. La plupart d'entre eux ont spécifiquement identifié Apple Pay comme moyen de paiement "incontournable".

Le marché européen des paiements en ligne a subi une transformation significative avec l'entrée et l'expansion des grandes entreprises technologiques, stimulées par une demande croissante des consommateurs pour plus de praticité, de sécurité et d'expériences de transaction sans interruption.

Les raisons de la croissance rapide des portefeuilles numériques des grandes entreprises technologiques, notamment Apple Pay et Google Pay, sont multiples. Tout d'abord, les portefeuilles numériques sont largement utilisés pour les achats en ligne sur les appareils mobiles, en raison de leur praticité et de leur sécurité présumée par rapport aux cartes physiques, une tendance observée pour 13 des 14 États membres selon l'enquête auprès des consommateurs présentée au chapitre 2. Les grandes entreprises technologiques sont donc bien positionnées pour capitaliser sur cette tendance et continuer à accroître leur influence à l'avenir. De plus, l'intégration des portefeuilles numériques des grandes entreprises technologiques dans des écosystèmes plus larges

leur confère un avantage concurrentiel décisif. Apple Pay et Google Pay, par exemple, offrent une intégration fluide et homogène des cartes de paiement à travers les canaux physiques et numériques, rendant les portefeuilles numériques des grandes entreprises technologiques plus attrayants pour les consommateurs et contribuant à leur notoriété croissante, souvent au détriment de concurrents autonomes. Ceci entraîne autre avantage en faveur des portefeuilles numériques des grandes entreprises technologiques, à savoir leur sécurité présumée et leur praticité par rapport notamment aux cartes de débit ou de crédit traditionnelles, comme révélé à la fois dans l'enquête auprès des consommateurs et dans la consultation des commerçants.

Les grandes entreprises technologiques pourraient exploiter leur position sur les marchés non financiers pour établir et étendre leur influence dans le domaine des services financiers. Cela pourrait alors potentiellement limiter l'accès au secteur à d'autres acteurs, favoriser leur moyen de paiement, créer des dépendances et, en fin de compte, affecter le paysage concurrentiel.

Premièrement, la consultation des acteurs du secteur a révélé certaines préoccupations concernant d'éventuelles restrictions d'accès qui pourraient être mises en place par les plateformes des grandes entreprises technologiques. Elles pourraient être en mesure d'imposer des conditions pour accéder à leurs plateformes ou de restreindre complètement cet accès. Cependant, elles n'auraient une incitation à le faire que dans la mesure où une telle pratique, en excluant les concurrents du secteur des paiements en ligne, leur permettrait d'augmenter leurs profits dans le secteur des paiements en ligne sans pertes significatives sur les marchés verticalement intégrés (par exemple, systèmes d'exploitation et app stores).

Une autre source potentielle de préoccupation est le fait que les grandes entreprises technologiques, grâce à leur contrôle des principales plateformes numériques, possèdent un accès sans pareil à de vastes quantités de données utilisateurs, qu'elles pourraient exploiter soit en concluant des partenariats avec les opérateurs historiques, en vendant les données et en offrant des services clés tels que l'analyse de données ou les services cloud, soit en les combinant avec l'offre de leur propre méthode de paiement en ligne aux clients. Cette capacité à intégrer les données de paiement avec des écosystèmes numériques plus larges renforce non seulement leur compétitivité, mais leur permet également d'extraire une plus grande rentabilité par rapport aux institutions financières traditionnelles. L'utilisation de ces données améliore l'expérience des utilisateurs également dans le secteur des paiements en ligne, et créer des dépendances renforçant davantage le rôle des grandes entreprises technologiques dans ce secteur. Notre consultation des acteurs du secteur a révélé certaines préoccupations concernant la possibilité pour les grandes entreprises technologiques d'exploiter les données qu'elles collectent à travers leurs écosystèmes. Les implications complètes de l'utilisation par les grandes entreprises technologiques de ces vastes bases de données au profit leurs moyens de paiement en ligne ne sont pas en revanche pas encore pleinement mesurées. Il semble probable qu'elles puissent exploiter les données collectées via leurs services de paiement pour améliorer leurs activités principales, telles que les moteurs de recherche, les réseaux sociaux et les marketplaces, en obtenant des informations détaillées sur les habitudes, les besoins et les préférences de chaque client.

Enfin, certaines stratégies peuvent entraîner la création de situations de dépendance par la mise en œuvre d'un traitement préférentiel de leur propre moyen de paiement. La prééminence des grandes entreprises technologiques dans le secteur des plateformes numériques tels que les réseaux sociaux et les app stores peut amener à privilégier leur propre moyen de paiement au travers d'un affichage plus favorables que celui accordé à leurs concurrents. Cela peut se produire à la fois sur leurs propres plateformes et sur les boutiques en ligne tierces, puisque les grandes entreprises technologiques peuvent être en mesure d'exploiter leurs vastes bases d'utilisateurs afin d'obtenir des conditions d'affichage plus favorables.

La consultation des commerçants et des fournisseurs d'applications de paiement révèle l'existence de pratiques d'affichage préférentielles favorisant les moyens de paiement des grandes entreprises technologiques à la fois dans leurs propres plateformes/appareils et dans les boutiques en ligne tierces. Les acteurs du secteur suggèrent que de telles pratiques peuvent découler d'accords contractuels entre les grandes entreprises technologiques et les commerçants ou résulter de contraintes imposées par les plateformes (c'est-à-dire par la mise en œuvre des interfaces de programmation d'application (API)).

Une pratique connexe est le bundle, par lequel les grandes entreprises technologiques peuvent exploiter les préférences des consommateurs pour des services dans lesquels elles jouissent d'une position concurrentielle forte pour stimuler leur moyen de paiement. La consultation des acteurs du secteur suggère qu'il existe une certaine préoccupation dans le domaine des paiements en ligne selon laquelle les grandes entreprises technologiques pourraient utiliser leur pouvoir de marché issue d'autres secteurs tels que les systèmes d'exploitation, la publicité en ligne ou la distribution d'applications pour encourager ou exiger l'adoption de leur moyen de paiement. Cela pourrait alors altérer les dynamiques concurrentielles en créant des avantages pour les portefeuilles numériques des grandes entreprises technologiques, en réduisant notamment la visibilité et l'attractivité des moyens de paiement rivaux et en limitant le choix des consommateurs. De plus, les bundles pourraient être utilisés pour contraindre d'autres prestataires de services de paiement à s'intégrer ou à s'appuyer sur l'infrastructure des grandes entreprises technologiques s'ils souhaitent rester disponibles sur ces plateformes, créant ainsi des situations de dépendance et renforçant davantage l'influence des grandes entreprises technologiques dans le secteur des paiements en ligne. Ces questions ont conduit les autorités de la concurrence de nationales à examiner de près la conduite des grandes entreprises technologiques dans le secteur des paiements en ligne.

### Le rôle de Paypal

Aux côtés des SCI, des banques et des grandes entreprises technologiques, Paypal est un acteur prospère dans le secteur des paiements en ligne depuis des années, et aujourd'hui encore il capture une part significative du nombre de transactions électroniques dans des pays comme l'Autriche, l'Allemagne, l'Italie et l'Espagne.

Les commerçants interrogés ont considéré Paypal comme une méthode de paiement "incontournable" pour leurs activités sur navigateur, leur application ou les deux. Les résultats de l'enquête auprès des consommateurs confirment la popularité de Paypal parmi les consommateurs de l'EEE : 65% des répondants ont déclaré posséder Paypal - une part comparable à celle des cartes ; celle-ci étant relativement plus élevée en Autriche, en Allemagne, en Italie et en Espagne.

Paypal a probablement maintenu sa position sur le secteur des paiements en ligne en raison de son avantage de premier entrant, de sa fiabilité et de son utilisation stratégique d'un système de portefeuille numérique intermédiaire. Son entrée précoce en 2004, son acquisition par eBay et sa fonctionnalité P2P ont contribué à sa croissance rapide dans le secteur.

Cependant, ces dernières années, Paypal a vu ses parts de marché diminuer, potentiellement en faveur des portefeuilles numériques des grandes entreprises technologiques, en particulier Apple Pay.

Le déclin de Paypal peut être attribué à plusieurs facteurs clés. Une raison majeure est que les clients préfèrent de plus en plus des expériences de paiement fluides et respectueuses de la vie privée, mais les processus complexes de vérification d'identité et de configuration de compte de Paypal nuisent à ces attentes. En 2018, eBay a déplacé ses opérations de paiement vers Adyen, une alternative plus transparente, qui a

probablement contribué à une perte de confiance des consommateurs en Paypal. De plus, les grandes entreprises technologiques, telles qu'Apple Pay et Google Pay, avec leurs puissants effets de réseau, leurs grandes bases d'utilisateurs et leurs technologies avancées, sont venu concurrencer la position de Paypal sur le secteur.

Un autre facteur est que Paypal reste principalement confiné aux marchés en ligne, tandis que les solutions de paiement mobile des grandes entreprises technologiques offrent une plus grande commodité avec les paiements sans contact via NFC, qui sont de plus en plus valorisés par les consommateurs. En outre, l'essor de nouveaux moyens de paiement, telles que les services A2A et BNPL, sont venus intensifier la pression concurrentielle perçue par Paypal.

Dans ce contexte, Paypal pourrait s'être engagé dans des pratiques visant à préserver sa position sur le marché des paiements en ligne, telles que des conditions d'affichage favorables. La mesure dans laquelle ces pratiques, le cas échéant, peuvent fausser la concurrence dépend du pouvoir de marché Paypal qui, à son tour, dépend de son statut de moyens de paiement "incontournable" qui peut varier selon les pays.

## Introduction

A consortium of firms comprising Lear, Capgemini and Verian (hereinafter, collectively, the “Project Team”), and led by Lear, has been appointed by DG Comp to carry out a market study exploring the level of competition in the sector of online payment transactions in a selection of EEA countries (the “Project”).

The background to this study is that the online payment sector has been recently characterized by a fast pace of changes, which are largely the result of developments in technology, regulation and consumer demand. These changes pose significant challenges for competition enforcement, also since online payments are not systematically analysed by any regulatory authority. Moreover, data at the level of aggregation that would be useful for competition analysis is not readily available.

Against this background, the Project aims at collecting data regarding the business volumes of the main operators of online payments in the EEA to provide novel evidence on the recent and expected evolution of the online payment sector; this data, combined with further qualitative evidence collected through a variety of methodologies, will allow the Project Team to carry out a competitive assessment and identify practices that are potentially harmful to competition.

The Project covers a selection of 14 countries: Austria, Czechia, Denmark, France, Germany, Hungary, Greece, Italy, Latvia, Netherlands, Poland, Portugal, Spain, and Sweden. The countries were selected based on the three criteria described in Annex A: firstly, demographic, geographic, and economic factors were considered to cover diverse EU regions, population sizes, and economic strengths; secondly, online payment adoption rates were assessed based on the percentage of Internet purchases made in 2022; thirdly, consumer behaviour was considered through an index of perceived barriers to online buying and ordering.

This report is structured as follows:

- chapter 1 identifies and defines key terms that are relevant to the scope of the study, providing a relevant categorization of market players. Building on this taxonomy, the most commonly used and accepted payment methods for e-commerce transactions are identified; chapter 1 further analyses the evolution of the online payment sector in the period 2018-2022, it discusses historical and upcoming trends characterizing the sector, it provides an overview of the prevailing business models of payment service providers (PSPs) and of their costs for consumers and merchants, and provides an estimation of the business volumes of international card schemes generated through digital wallets;
- chapter 2 provides original evidence on the effects on consumers’ choice of payment methods of practices by market participants that affect the display of payment methods, based on the results of a representative consumer survey and a behavioural experiment. The design of the survey and experiment was informed by a literature review on the determinants of consumers’ choice of payment methods and a mystery shopping activity to identify the most common display practices on merchants’ platforms;
- chapter 3 discusses the main drivers of substitutability between payment methods, providing insights on the extent to which different payment methods put competitive pressure on one another; and it provides an overview of the recent (2018-2022) evolution in the online payment sector in selected countries, based on Capgemini data on the share of e-commerce transactions attributable to various payment methods, discussing the main drivers of the observed trends;
- chapter 4 discusses some structural features of the online payment market that could contribute to raising barriers to entry or expansion for smaller industry

players and that may give incumbent players the ability and incentive to implement practices capable of distorting competition. With this premises in mind, the chapter provides a framework to assess potential practices that certain market players may implement to strengthen their position in online payments, focusing on the behaviour of ICS, Big Techs, banks and Paypal.

Each chapter from 1 to 4 includes a detailed description of the methodology adopted.

The following documents are attached to this report:

- Annex A which includes the design of the country selection for the study;
- Annex B which includes the methodology used to close data gaps based on existing data, as used in chapter 1 Table 1.14;
- Annex C which includes the literature review of chapter 2;
- Annex E which includes the definition of segments used in the analysis of chapter 2;
- Annex F which includes the regression tables used for the analysis of chapter 2
- Annex G which includes the description of the stakeholder questionnaires' structures and the description of the characteristics of the stakeholder questionnaires' respondents;
- Annex K which includes the additional analysis of the share of value of e-commerce transactions of selected providers in the segment of digital wallets including additional local payment methods;

The consumer survey, and the questionnaires for merchants, providers of payment applications and card schemes (respectively, Annex D, Annex H, Annex I and Annex J) are included in a separate document.

## 1. Chapter I: Market overview

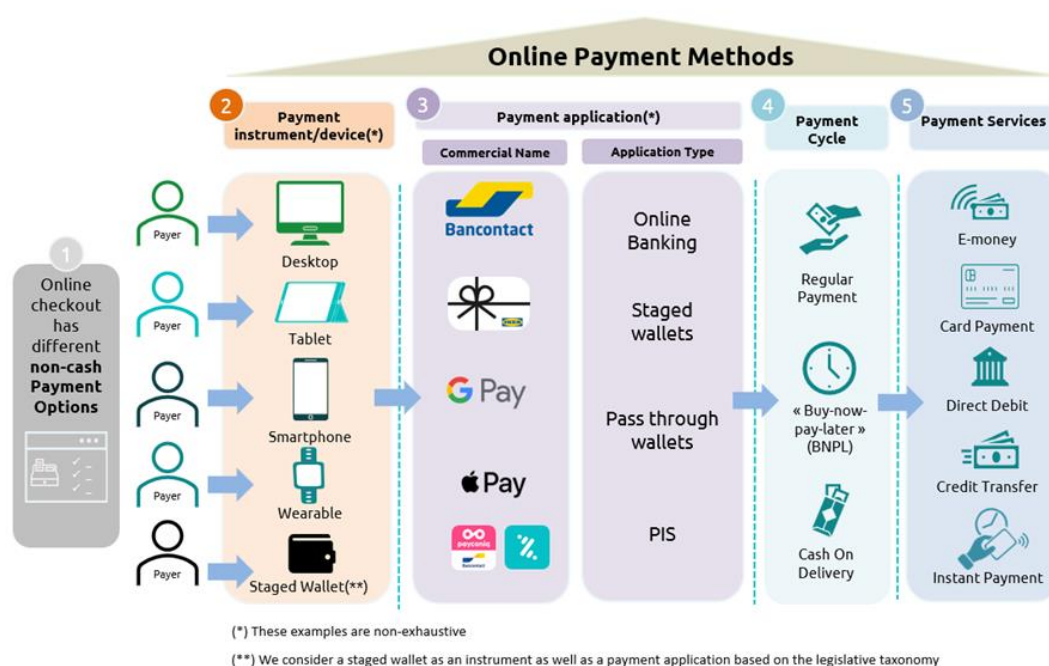
This chapter provides the taxonomy used for the purpose of this study. Second, it zooms in on the five most used online payment methods and their availability in selected EEA countries. Third, the chapter analyses the evolution of online payment trends with a particular focus on the impact of the COVID-19 crisis and historical changes. Finally, the different business models of the various stakeholders within the payment ecosystem are described.

### 1.1. The taxonomy applied for this study

Consumers engage in e- or m-commerce using various devices, including mobile (e.g., smartphones, wearables, tablets) and non-mobile (e.g., desktop PCs). These devices host applications that facilitate payments, such as Apple Pay on iPhone or gift cards in merchant apps. The applications use different payment services, like direct debits, credit transfers, card payments, and SEPA-wide e-money.

An online payment method is defined for the purpose of this Study as a combination of these devices, applications, and payment services, used for online purchases. Staged-digital wallets, categorized as payment instruments, can also be used for payment applications at the Point of Interaction (POI). Payment methods include credit and debit card transactions, bank transfers, buy-now-pay-later solutions (BNPL), and digital wallets.

**Figure 1.1: Consumers' experience of payment methods**



Source: Capgemini 2024

This overarching framework together with the definitions provided in the relevant EU legislation is translated into the various tables below. The first table gives an indication of how certain commercially named products provide different payment services. The tables afterwards categorize the definitions used for the purpose of this study starting with definitions of (1) E- and M-Commerce, (2) Stakeholders (3) Own Taxonomy and (4) Payment Methods.

**Table 1.1: Use of Payment Application connected to Payment Service (exemplary)**

1) Commercial Name	2) Application Type	3) Payment Service
<b>Paypal</b>	Staged Wallet	E-Money Cards Direct Debit Credit Transfer Instant Payment
<b>Google Pay/ Apple Pay</b>	Pass-through wallet	Cards Direct Debit Credit Transfer
<b>Bancontact</b>	Online Banking	Credit Transfer Direct Debit
<b>IKEA (e.g. gift card)</b>	PIS	Credit Transfer Direct Debit E-Money
<b>Payconiq</b>	PIS	Credit Transfer
<b>Bizum</b>	PIS	Instant Payment

Source: Project Team

**Table 1.2: Definitions of E- and M-Commerce**

Term	Definition
<b>E-commerce</b>	<p>E-commerce encompasses the sale and purchase of goods, utilities or services through electronic transactions conducted via the internet, other computer-mediated networks or equivalent. This definition extends to transactions between online merchants (payee) and consumers (payer), leveraging information technology (IT) to support economic exchanges across three distinct phases. These phases include:</p> <ol style="list-style-type: none"> <li>1. The information phase, where participants gain a market overview and select providers and products.</li> <li>2. The agreement phase, which involves the negotiation of conditions and the conclusion of contracts or the approach of dynamic pricing.</li> <li>3. The settlement phase, covering the delivery and payment for services.<sup>1</sup></li> </ol>
<b>M-commerce</b>	<p>M-commerce is a subset of e-commerce which encompasses transactions conducted through a mobile device, smartphones, tablets and wearables, etc. to buy goods and services online.<sup>2</sup></p>

Source: Project Team

<sup>1</sup> Eurostat Glossary, available via: [Eurostat](#); Alt, R. & Huch, S., *Fintech Dictionary - Terminology for the Digitalized Financial World*, Springer, Wiesbaden, 2022, p. 85.

<sup>2</sup> COMMISSION STAFF WORKING DOCUMENT Online services, including e-commerce, in the Single Market, p. 6, available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011SC1641>

**Table 1.3: Stakeholder definition**

Stakeholder	Definition
<b>Payer</b>	A natural or legal person who holds a payment account and allows a payment order from that payment account or, where there is no payer's payment account, a natural or legal person who makes a payment order to a payee's payment account. <sup>3</sup>
<b>Payee</b>	A natural or legal person who is the intended recipient of funds which have been the subject of a payment transaction. <sup>4</sup>
<b>Payment Initiation Service Providers (PISPs)</b>	A payment service provider authorized to initiate a payment order at the request of a payer from their payment account to the payee's payment account. This service facilitates online payments directly from the payer's bank account, bypassing traditional payment instruments such as credit or debit cards. PISPs act as an intermediary that creates a software bridge between the merchant and the payer's bank. <sup>5</sup>
<b>Payment Card Scheme</b>	<b>Payment Card Scheme:</b> a single set of rules, practices, standards and/or implementation guidelines for the execution of card-based payment transactions and which is separated from any infrastructure or payment system that supports its operation, and includes any specific decision-making body, organisation or entity accountable for the functioning of the scheme.
	<p><b>Four party payment card scheme:</b> a payment card scheme in which card-based payment transactions are made from the payment account of a payer to the payment account of a payee through the intermediation of the scheme, an issuer (on the payer's side) and an acquirer (on the payee's side).</p> <p><b>Three party payment card scheme:</b> a payment card scheme in which the scheme itself provides acquiring and issuing services and card-based payment transactions are made from the payment account of a payer to the payment account of a payee within the scheme. When a three-party payment card scheme licenses other payment service providers for the issuance of card-based payment instruments or the acquiring of card-based payment transactions, or both, or issues card-based payment instruments with a co-branding partner or through an agent, it is considered to be a four-party payment card scheme.</p>
<b>Payment Gateway Provider</b>	Provides the interface (gateway) or online payment terminal that encrypts and transmits sensitive payment information securely and facilitates authorization of transactions, typically for e-businesses. <sup>6</sup>

<sup>3</sup> Art. 4(8) PSDII; Art. 2(14) IFR<sup>4</sup> Art. 4(9) PSDII; Art. 2(13) IFR<sup>5</sup> Alt, R. & Huch, S., Fintech Dictionary - Terminology for the Digitalized Financial World, Springer, Wiesbaden, 2022, p. 151.<sup>6</sup> Own definition.

<b>Card Issuer</b>	The card issuer refers to a payment service provider contracting to provide a payer with a payment instrument to initiate and process the payer's card-based payment transactions. <sup>7</sup>
<b>Acquirer</b>	The acquirer refers to a payment service provider contracting with a payee to accept and process card-based payment transactions, which result in a transfer of funds to the payee. <sup>8</sup>
<b>Mobile Wallet Providers</b>	A mobile wallet provider is a company that provides an application on mobile devices like smartphones or tablets which can be used for non-cash payment transactions for instance. <sup>9</sup>
<b>Issuing Processor</b>	An issuing processor performs the role of evaluating and either approving or rejecting payment card transactions for the payment service issuer. Additionally, it handles the settlement of transactions and manages the cardholder data system of record.
<b>Acquiring Processor</b>	An acquiring processor approves transactions and gathers information on transaction settlements. It serves as a bridge connecting the merchant, payment scheme or any other payment substitute or complement provider and acquirer. Furthermore, it assesses the legitimacy of transactions, ensures they are sanctioned by the creditor bank and actively seeks to reduce fraud and chargebacks.

*Source: Project Team*

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<sup>7</sup> Art. 2(2) IFR

<sup>8</sup> Art. 2(1) IFR

<sup>9</sup> R. Alt & S. Alt, R. & Huch, S., *Fintech Dictionary - Terminology for the Digitalized Financial World*, Springer, Wiesbaden, 2022, p. 132; Oxford English Dictionary, available via: Oxford English Dictionary

Table 1.4: Overview of Own Taxonomy

Online Payment Option			
On the vertical dimension, a payment option describes the different options of e.g., payment instruments/devices, payment applications, payment cycles or related payment services a payer is presented with at the checkout of an online store.			
Online Payment Method			
The horizontal process that encompasses the combination of devices/payment instruments and applications that rely on a payment service, which consumers use for online purchases of goods and services.			
Payment Instrument/Device	Payment Application	Payment Cycle	Payment Service
Any technological device, such as a card, mobile phone, tablet, TV, computer, or wearable that contains the appropriate payment application which enables the consumer/payer to initiate on- or offline payment. <sup>10</sup>	<p>Computer software or equivalent loaded on a device enabling card-based payment transactions to be initiated and allowing the payer to issue payment orders.<sup>11</sup> The application is the enabler that allows to process the essential information concerning the parties and the payment service used.</p> <p>We distinguish between</p> <ol style="list-style-type: none"> <li>(1) <b>Commercial Name:</b> i.e. the brand name of a payment application. (e.g. Apple Pay).</li> <li>(2) <b>Application Type:</b> the function of the computer software or equivalent (e.g., pass-through wallet and staged wallet).</li> <li>(3) <b>Payment Service Type:</b> the complementary category (e.g., card transactions or direct debit).</li> </ol>	Time when the payer pays for the goods or services. The payer decides to pay now, or later (e.g., Buy-Now-Pay-Later, Cash on Delivery).	Non-cash payment services are direct debits, credit transfers, payment cards, as well as any other new payment instruments like e-money. <sup>12</sup> The instrument is the element that performs the core function of transferring funds from the payer to the payee.

Source: Project Team

<sup>10</sup> Own definition. We consider a staged wallet as an instrument as well as a payment application based on the legislative taxonomy. However for completeness' sake we also acknowledge that a staged wallet can be a type of application. Therefore we also mention it under a Payment Application Type.

<sup>11</sup> Art. 2(21) IFR.

<sup>12</sup> Own definition. We consider a staged wallet as an instrument as well as a payment application based on the legislative taxonomy. However, for completeness' sake we also acknowledge that a staged wallet can be a type of application. Therefore, we also mention it under a Payment Application Type.

**Table 1.5: Payments Methods Terminology**

Term	Definition
<b>Payment Services</b>	
<b>Payment Card</b> (including virtual card tokens)	<b>Debit Card:</b> means a category of payment service that enables the payer to initiate a direct debit or an authorized card transaction which is directly debiting the debtor's account. Including those with prepaid cards that are not a credit card transactions. <sup>13</sup>
	<b>Credit Card:</b> a card-based payment transaction where the amount of the transaction is debited in full or in part at a pre agreed specific calendar month date to the payer, in line with a prearranged credit facility, with or without interest. <sup>14</sup>
	<b>Prepaid Card:</b> means a category of payment service on which electronic money, as defined in point 2 of Article 2 of Directive 2009/110/EC, is stored. <sup>15</sup>
<b>Electronic Money (E-money)</b>	Electronically, including magnetically, stored monetary value as represented by a claim on the issuer which is issued on the receipt of funds for the purpose of making payment transactions and which is accepted by other natural or legal persons than the issuer. <sup>16</sup>
<b>Cash on delivery</b>	Payment option where the consumer (payer) makes a payment to the online merchant (payee) upon delivery and acceptance of the goods and services. <sup>17</sup>
<b>Credit Transfer</b>	A payment service that enables the transfer of value across national or cross-border contexts by crediting a payee's account through a single or series of payment transactions from a payer's account. This service operates based on instructions provided by the payer and is facilitated by the payment service provider (PSP) that holds or administers the payer's account. <sup>18</sup>
<b>Direct Debit</b>	A payment service that enables the transfer of value across national or cross-border contexts by debiting a payer's account upon initiation by the payee, based on the payer's consent, enabling the authorized debiting of the payer's account to transfer funds as agreed. This consent may be given directly to the payee, to the payee's payment service provider (PSP), or to the payer's own PSP. <sup>19</sup>

<sup>13</sup> Art. 2(33) IFR.

<sup>14</sup> Definition based on Art. 2(34) IFR & Art. 2(5) IFR.

<sup>15</sup> Art. 2(35) IFR.

<sup>16</sup> Art. 2 (50) PSR.

<sup>17</sup> Own definition.

<sup>18</sup> Art. 2(1) Regulation (EU) No 260/2012 of the European Parliament and of the Council of 14 March 2012 establishing technical and business requirements for credit transfers and direct debits in euro and amending Regulation (EC) No 924/2009 Text with EEA relevance, Hereafter defined as SEPA Regulation; ECB Glossary.

<sup>19</sup> Art. 2(2) SEPA regulation; ECB Glossary.

<b>Instant Payment</b>	A payment which is executed immediately, 24 hours a day and on any calendar day. <sup>20</sup>
<b>Payment instruments/devices &amp; application</b>	
<b>Digital Wallet</b>	<b>Digital wallet<sup>21</sup>:</b> software or equivalent enabling the initiation of transactions when they contain an underlying payment application or applications (pass-through wallets – payment applications) or when they rely on funding sources for future electronic money transactions (staged wallets – payment instruments). A pass-through digital wallet can contain one or several underlying payment applications and can itself be stored on one or several payment instruments (e.g. a smartphone and/or a computer). <sup>22</sup>
<b>Staged wallet</b>	A type of digital wallet that allows users to store funds by 'topping up' for future online transactions. This wallet functions in two main stages. In the first stage, consumers need to top up the wallet, effectively transferring funds into it to prepare for future use. In the second stage, the wallet is utilized to transfer electronic money to online merchants as consumers make purchases. <sup>23</sup>
<b>Pass-through wallet</b>	A type of digital wallet containing one or several payment applications (for instance a tokenised card resulting in one or several tokens) which enables the initiation of such transactions. These wallets can be stored (e.g. on a smartphone and/or computer). Additionally, this category of digital wallets can involve the tokenization of an existing payment instrument, such as a payment card. The token generated is a payment application, and the wallets containing this also qualifies as 'payment applications'.
<b>Mobile Wallets</b>	A mobile wallet is a payment application on a mobile device under which a consumer (payer) can store payment cards (tokens), account details or other payment applications which then can be used for payment transactions (pass-through). Like a digital wallet, mobile wallets can also be staged wallets. <sup>24</sup>
<b>Online Banking based e-payments</b>	These are transactions initiated through online banking (clearing and settlement schemes of EEA banks) and payment initiation services by the payer. It excludes payments initiated by the payer via online

<sup>20</sup> Art. 1(a) Regulation (EU) 2024/886 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 March 2024 amending Regulations (EU) No 260/2012 and (EU) 2021/1230 and Directives 98/26/EC and (EU) 2015/2366 as regards instant credit transfers in euro. Hereafter defined SCT Inst Regulation.

<sup>21</sup> Recital (24) PSR.

<sup>22</sup> European Commission, Directorate-General for Competition, Pavel, F., Kornowski, A., Knuth, L. et al., Study on the application of the Interchange Fee Regulation – Final report, Publications Office, 2020, p. 145, available at: <https://data.europa.eu/doi/10.2763/137970>.

<sup>23</sup> European Commission, Directorate-General for Competition, Pavel, F., Kornowski, A., Knuth, L. et al., Study on the application of the Interchange Fee Regulation – Final report, Publications Office, 2020, p.145, p. 74.

<sup>24</sup> European Commission, Directorate-General for Financial Stability, Financial Services and Capital Markets Union, Bosch Chen, I., Fina, D., Hausemer, P. et al., A study on the application and impact of Directive (EU) 2015/2366 on Payment Services (PSD2), Publications Office of the European Union, 2023, p.27, <https://data.europa.eu/doi/10.2874/996945>.

	banking not involving a simultaneous online shopping transaction and invoices presented online. <sup>25</sup>
<b>Payment Initiation Service</b>	In Open Banking, a service offered by a PISP to initiate a payment order at the request of a payment service user with respect to a payment account held at an account servicing payment service provider. <sup>26</sup>
<b>Account-to-account (A2A) payment</b>	PIS are A2A which are notably used in e-commerce as a payment application. In the narrow sense it is a transfer of funds between payment accounts of the payer and the payee without the use of any other additional intermediary than the banks. <sup>27</sup>

Source: Project Team

## 1.2. Review of top five online payments methods and their availability in EEA countries

For this study, the top five payment methods in the selected EEA countries have been identified based on their share in terms of the overall value of e-commerce transactions in each country. To determine the geographical scope for the market study, it was necessary to establish criteria for selecting countries within the European Economic Area (EEA). As set out in the proposal for this study the objectives were to capture diverse populations and cultures and represent the economic as well as geographic variations within the EEA. For this selection the following criteria were applied: (1) Demographic, geographic and economic criteria (2) number of online purchases/transactions and (3) index of perceived barriers to buying goods and services on the internet. Based on these criteria the following countries were selected for this study: Austria, the Czech Republic, Denmark, France, Germany, Hungary, Greece, Italy, Latvia, the Netherlands, Poland, Portugal, Spain, and Sweden.

The analysis aims at reflecting the agreed taxonomy, which defines the payment method as a combination of payment application, payment cycle and payment service. Nonetheless, in some instances, the available data are not sufficiently granular, and data was aggregated at the level of payment application (e.g. digital wallet) or cycle (e.g. BNPL). The availability rate of each payment method was examined (i.e. the percentage of merchants accepting these payment methods) looking at the top 10 e-commerce websites in each country.

<sup>25</sup> GUIDELINES OF THE EUROPEAN CENTRAL BANK of 4 April 2014 on monetary and financial statistics, of 4 April 2014, accessible via: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:3201400015&from=DE>.

<sup>26</sup> COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT, Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on payment services in the internal market and amending Regulation (EU) No 1093/2010 and Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on payment services and electronic money services in the Internal Market amending Directive 98/26/EC and repealing Directives 2015/2366/EU and 2009/110/EC p. 5 available at: [PSD2\\_Commission staff working document - impact assessment - template Jan 2021 \(europa.eu\)](https://ec.europa.eu/commission/presscorner/detail/en/ip19_111).

<sup>27</sup> Proposal for a Regulation of the European Parliament and of the Council amending Regulations (EU) No 260/2012 and (EU) 2021/1230 as regards instant credit transfers in Euro, p. 2; [Capgemini Payments Report](#) p. 12.

### 1.2.1. Five most commonly used methods for online payments for each EEA country covered

Table 1.6 provides a share of various payment methods based on data from 2022 and 2023, used in e-commerce across different European countries. The data is based on the E-Commerce Analytics report from GlobalData, which provides the value of e-commerce transactions, a breakdown of e-commerce payments by various payment methods and in-app payments data. The foundation in the data is rigorous secondary research. GlobalData collects and standardizes metrics from national sources and competitors, including central banks, industry associations, and national statistics offices in each country mentioned in the report. This data is further enhanced by an extensive program of executive interviews. The data has also been derived from GlobalData's annual Financial Services Consumer Surveys. The analysis examines questions related to consumers' online purchasing behaviour, focusing on their preferred payment methods and the amounts they spend. Consequently, it is dependent on consumer perceptions and awareness, which means it may vary slightly from hard data in some instances. The data undergoes a thorough quality control process, which includes multiple stages of quality checks prior to its publication on the platform. Quality checks are implemented at various stages of the production process to ensure the accuracy of each indicator included in the database of GlobalData. The data includes all the selected EEA countries and exclusively covers online payments, thus excluding payments at POS. The percentages in the table represent the share of e-commerce in terms of value which are most commonly used by customers from the given country paying to any merchant. This exercise is meant to provide the distribution of the overall e-commerce transaction values in the selected EEA countries among payment methods and does not prejudge possible market definitions. The payment applications that are highlighted in blue are those considered among the top five in each country.

The table is constructed as follows:

- Pass-through wallets include Apple Pay, Google Pay, Masterpass, Samsung Pay, Meta Pay, Click to Pay from Mastercard and Visa, and national wallets such as MobilePay and Paysera;
- The staged digital wallets include Paypal and Amazon Pay and national players such as CaixaWallet and PostePay;
- The category Online Banking includes all credit transfer and PIS transactions done via the mobile app and desktop for e- and m-commerce purchases. Online Banking refers to the electronic banking services provided by financial institutions, allowing customers to access their bank accounts, view balances, transfer funds, pay bills, and perform other banking transactions over the internet. MBWay, BancomatPay, and NexiPay fall in this category. In the context of e-commerce, online banking can be used as a payment application using different payment services, e.g. credit transfer, for making purchases in e-commerce. The Online Banking App in this taxonomy covers all credit transfer and any kind of PIS which has been directly initiated by the consumer;
- iDEAL, Bizum, Swish, Blik, MyBank, ePrzelewy, Trustly and Sofort are categorised as banking In-Apps and categorized as PIS because they are integrated into banking applications and the method of authentication is via an online banking login, offering users direct access to their bank accounts for payments and transfers;
- Regular payments, meaning all payments where the payer's account is debited immediately, have been differentiated depending on the payment service. Data does not allow a similar breakdown for other payment applications such as BNPL;
- Deferred debit and credit cards (including revolving credit with payment terms) are categorized as credit cards. They are classified as regular payments, even

when revolving credit is associated with BNPL, since products and services are provided upon ordering, while the funding of the customer account occurs later for revolving credit card transactions. This process requires entering card details on the e-commerce site without redirecting the customer to an online banking environment. An example of deferred debit and revolving credit is Carte Bancaire payments in France. Prepaid includes both credit and debit as it is not possible to know how the transaction is processed. VISA and MasterCard debit cards are included in the debit card category and never in the credit card category. The credit card category only includes credit card transactions;

- The category (SEPA) instant Credit Transfers ((S)CT(-Inst)) includes euro and non-euro transactions. For example, in Poland the total number consists of non-euro Inst transactions and euro Inst transactions which are based on the One Leg Out regulation. One-Leg Out (OLO) transaction is a transaction in any possible currency under the condition that at least one of the two legs is denominated in EUR (Euro leg); an incoming or outgoing account-to-account-based credit transfer; and processed instantly on a 24/7/365 basis in the "Euro leg".<sup>28</sup> The number in Poland thus presents the instant credit transfers from national customers and SEPA instant credits transfers from e.g. foreign customer. No split can be made in the share per payment method in e-commerce between national and cross-border, i.e. between national customers and credit transfers from foreign countries;
- BNPL includes payment by instalments and time-limited interest-free partial payments as well as pay per invoices with payment terms of 30 days.<sup>29</sup> Klarna, Scalapay and other unidentified national solutions<sup>30</sup> are BNPL solutions.<sup>31</sup> Although Klarna has more functions compared to Scalapay (e.g. instant payments and long-term credit options with interest), they cannot be separated and for that reason its usage is fully categorized under BNPL;
- Pay by Invoice is the billing methodology where a merchant bills his customer for the purchases of goods or services in the e-commerce through the invoice and is a subcategory of BNPL for the purpose of this Study. The invoice includes important transaction details like pricing, product ID, company account information and due date;
- Cash/Card on Delivery stands out from other payment methods because the customer pays for the goods at the time of delivery, rather than making an upfront payment during the purchase process. This option is typically presented separately during the online checkout phase;
- The other category includes the rest of the online payment methods, such as voucher codes, cryptocurrencies, direct carrier billing and loyalty points.

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<sup>28</sup> ECB, "One-Leg Out Instant Credit Transfer (OCT Inst) Scheme Rulebook", (2023), Accessible via: [https://www.ecb.europa.eu/paym/target/target-professional-use-documents-links/tips/shared/pdf/tipsmeetdoc/ecb.tipsmeetdoc231012\\_TIPS-CG\\_One-Leg\\_Out\\_Inst\\_Credit\\_Transfer\\_Scheme.en.pdf](https://www.ecb.europa.eu/paym/target/target-professional-use-documents-links/tips/shared/pdf/tipsmeetdoc/ecb.tipsmeetdoc231012_TIPS-CG_One-Leg_Out_Inst_Credit_Transfer_Scheme.en.pdf).

<sup>29</sup> Klarna, "A Smarter Way to Shop", (2024), Accessible via: <https://www.klarna.com/us/what-is-klarna/>, Klarna.

<sup>30</sup> They are unidentified because they have limited relevance in the European e-commerce landscape.

<sup>31</sup> There is a potential overlap in the data between BNPL and regular payments. However, it is not the same as for online banking, where PIS and CT have been added up.

**Table 1.6: Relative e-commerce value of transactions per payment method per country from a consumer perspective**

Online Payment Method			AT	CZ	DK	FR	DE	EL	HU	IT	LV	NL	PL	PT	ES	SE
Application	Digital Wallet	Pass-through digital Wallet	1,61%	14,47%	23,24%	4,43%	8,80%	6,48%	10,64%	5,51%	9,11%	7,76%	5,09%	3,30%	5,27%	7,80%
		Staged digital Wallet	16,00%	7,33%	4,22%	15,16%	30,00%	7,64%	6,31%	25,50%	4,36%	8,54%	2,89%	10,28%	17,45%	2,86%
	Online Banking (1, 2)	/	15,45%	31,47%	11,35%	8,81%	11,48%	12,02%	18,83%	11,51%	41,72%	37,60%	65,80%	24,95%	7,44%	24,00%
	PIS (1)	/	-	-	1,80%	-	1,20%	-	-	5,14%	-	29,86%	34,67%	16,13%	2,87%	7,19%
Payment Cycles and respective Payment Services	Regular Payments	Credit Cards	26,74%	22,39%	28,88%	33,47%	12,10%	30,37%	6,35%	18,78%	16,83%	12,86%	7,93%	20,30%	32,37%	14,66%
		Debit Cards	8,47%	14,87%	17,19%	17,32%	0,00%	26,23%	9,76%	10,28%	12,09%	4,07%	9,66%	21,03%	19,61%	12,27%
		Prepaid	0,50%	0,67%	1,25%	0,34%	0,56%	2,39%	1,50%	5,66%	1,07%	0,48%	1,22%	1,18%	2,38%	1,69%
		(S)CT(-Inst) (2)	15,45%	31,47%	9,55%	8,81%	10,28%	12,02%	18,83%	6,37%	41,72%	7,74%	31,13%	8,82%	4,57%	16,81%
		SDD	10,61%	1,18%	1,67%	9,19%	16,62%	0,58%	3,27%	4,26%	0,00%	3,51%	0,20%	5,60%	5,38%	3,90%
	BNPL	BNPL Solutions	8,77%	0,54%	5,01%	3,39%	22,86%	-	-	3,77%	-	13,09%	2,90%	0,16%	2,24%	22,97%
		Pay by Invoice	-	-	2,86%	1,53%	4,86%	-	-	-	-	1,76%	1,36%	-	0,91%	3,72%
	Cash/Card on Delivery	/	5,00%	15,37%	4,57%	2,31%	2,90%	9,35%	7,00%	7,81%	9,30%	1,00%	1,58%	6,56%	4,28%	3,74%
	Other	/	1,88%	4,08%	5,15%	5,57%	6,60%	2,74%	5,24%	6,89%	5,52%	4,14%	2,64%	2,26%	3,78%	6,12%

Source: Capgemini Research Institute for Financial Services Analysis, GlobalData, Statista, ECB, EHI

Note: \*Total numbers per country can be more than 100% due to double counting per category/overlaps of categories. These values do not constitute market shares and do not prejudice possible market definitions.

\*\* A '-' is placed when not enough data is available

\*\*\* (1) and (2) indicate there are overlaps in the categories

Findings from Table 1.6 should be assessed with caution. Different payment methods may not be competing with each other, and these findings therefore do not constitute market shares. Relevant markets would have to be defined. Since some payment methods are inputs to others, it is not always possible to completely disentangle one method from another and there may be instances of double counting.

Where feasible, card transactions are reported separately from wallet transactions; however, limited double counting could still occur in certain countries. At the same time, while granular data are not available, it can be assumed that the majority of the transactions in wallets are also card transactions, and these should also be considered when assessing the role of cards in the online payment sector.

In Table 1.6, there are two sub-categories for digital wallets: Pass-through and Staged Digital Wallets. The use of these wallets varies, with Italy and Germany showing a higher preference for staged digital wallets compared to pass-through. This is because Paypal is used for 15.2% of online transactions in Italy and 29.60% in Germany. In the Czech Republic and Denmark, on the other hand, the use of pass-through wallets is higher. This is because Apple Pay in Czech Republic and MobilePay in Denmark have higher usage rates.

The use of online banking is high in every analysed country. The high share of online banking in Poland, Portugal and the Netherlands can be because, BLIK, MBWay and iDEAL are national players that are in-app payment applications and services are widely used in their respective countries.

Credit cards consistently rank among the top five most used payment methods, except for Hungary. In this country, as well as Poland and Portugal, debit cards have a higher share. Specifically, France, Greece and Spain have the highest value share of credit cards. Conversely, Spain, Greece and Portugal have the highest value share of debit cards. It is most likely that these countries, as well as France, have a higher share because VISA and MasterCard debit cards were made available earlier than, for example, in Germany and the Netherlands<sup>32</sup>.

VISA and Mastercard play a relevant role among the card schemes: in the selected EEA countries, VISA's and Mastercard's represent on average 45% and 53% of the e-commerce cards' transactions, respectively.<sup>33</sup>

The Buy Now Pay Later (BNPL) option is widely used in Germany and Sweden. This is because Klarna has a significant market presence. Cash on delivery is particularly popular in Czech Republic.

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<sup>32</sup> Volksbank Stuttgart eG, "girocard Visa Debit", (2023), available at: <https://www.volksbank-stuttgart.de/privatkunden/girokonto-kreditkarten/girokonto/girocard-visa-debit.html>.

Mollie, "Debit Mastercard en Visa Debit: de nieuwe generatie betaalkaarten", (2023), Available at: <https://www.mollie.com/nl/news/debit-mastercard-visa-debit>.

NBG, "DebitMasterCard", (2014), Available at: <https://web.archive.org/web/20150317132354/https://www.nbg.gr/el/retail/cards/debit-cards/debitmastercard>.

<sup>33</sup> The share is calculated by averaging the share of VISA and Mastercard of each country discussed in this report. PPRO, "country reports", available at: <https://www.ppro.com/countries/>.

The data suggests that preferences for payment methods vary from country to country, with some regions favouring traditional methods such as credit cards and cash on delivery, while others are more inclined towards online banking and digital wallets.

### **1.2.2. Availability Rate of the Most Commonly Used Payment Methods**

The payment methods accepted by the top 10 e-merchant platforms by revenue per country were analysed to determine the availability of the most used payment methods: 124 e-merchants in total were analysed, who were part of the top 10 in their respective country. For instance, in Hungary, only the top 5 e-merchants based on revenue were identified, because of limited data availability. For Greece and Latvia, the top 5 e-merchants were determined using the visit index, because there was no data available based on revenue<sup>34</sup>. For Austria, the 9<sup>th</sup> largest e-merchant has been taken out of the analysis because it is a subsidiary of the Austrian Central Bank minting coins and for that reason not comparable to the other e-merchants in other countries. One website in Latvia is inaccessible from outside the country and thus was also excluded from the analysis.

The top 10 selected e-merchants for each country are listed in Table 1.7 below.

In Table 1.8 the percentage of net sales of the top 10 e-merchants over the overall e-commerce value within a country is presented. Whenever possible, the number of e-merchants per country is provided. The table indicates that the top 10 have a strong presence in some countries: for example, in Germany the top 10 e-merchants account for almost 30% of e-commerce, even though more than 460.000 merchants are active in the sector.

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<sup>34</sup> ECDB only provided the top 5 e-merchants for Greece and Latvia. Due to uncertainty about the top 10 and in order not to affect the quality of the data, only the top 5 webshops were selected.

Table 1.7: top 10 e-merchants per country based on net sales for B2C in million EUR

Ranking	Year	AT	Net sales	CZ	Net sales	DK	Net sales	FR	Net sales	DE	Net sales	EL*	Net sales	HU	Net sales
1	2023	amazon.de	882.45	alza.cz	1055.16	zalando.dk	250.74	amazon.fr	4628.7	amazon.de	15361.56	shein.com	204.39	emag.hu	207.27
2	2022	zalando.at	326.7	rohlik.cz	285.57	apple.com	241.11	veepee.fr	1602	otto.de	4998.42	public.gr	121.05	kifli.hu	123.3
3	2022	ikea.com	234.63	mall.cz	237.78	elgiganten.dk	200.88	cdiscoun.com	1273.5	zalando.de	2443.32	zara.com	87.75	alza.hu	105.3
4	2022	universal.at	191.25	datart.cz	142.38	hm.com	191.34	apple.com	1205.1	mediamarkt.de	2093.13	plaisio.gr	85.32	tesco.hu	84.06
5	2023	mediamarkt.at	179.37	czc.cz	132.75	boozt.com	151.38	auchan.fr	1190.7	ikea.com	1454.4	praktiker.gr	71.91	mediamarkt.hu	83.61
6	2023	ottoversand.at	145.62	ikea.com	128.16	ikea.com	149.31	shein.com	1184.4	apple.com	1143	/	0	/	0
7	2022	apple.com	144.18	zalando.cz	116.55	matas.dk	117.45	coursesu.com	1136.7	saturn.de	1017.81	/	0	/	0
8	2023	bestsecret.at	126.09	apple.com	115.29	asos.com	116.82	e.leclerc	951.3	lidl.de	975.78	/	0	/	0
9	2023	/	0	notino.cz	109.26	shein.com	116.01	leroymerlin.fr	950.4	aboutyou.de	900.27	/	0	/	0
10	2023	xxxlutz.at	113.85	hm.com	93.06	coop.dk	110.79	zalando.fr	855	hm.com	858.15	/	0	/	0

Ranking	Year	IT	Net sales	LV*	Net sales	NL	Net sales	PL	Net sales	PT	Net sales	ES	Net sales	SE	Net sales
1	2023	amazon.it	5337.27	220.lv	3.44	bol.com	2021.13	mediaexpert.pl	1311.39	shein.com	210.78	amazon.es	4752	apotea.se	468.72
2	2022	shein.com	1115.37	Airbaltic.com	3.33	coolblue.nl	1471.68	euro.com.pl	610.83	amazon.es	193.14	elcorteingles.es	1254.6	hm.com	362.7
3	2022	apple.com	647.37	Go3.lv	2.08	ah.nl	1021.77	zalando.pl	428.31	continente.pt	148.95	shein.com	772.2	elgiganten.se	331.38
4	2022	zalando.it	528.75	/	0	amazon.nl	742.5	amazon.pl	299.43	apple.com	138.96	apple.com	603	apple.com	321.48
5	2023	unieuro.it	526.59	1a.lv	1.49	jumbo.com	721.71	ikea.com	291.06	zara.com	135.45	mediamarkt.es	519.3	zalando.se	307.62
6	2023	mediaworld.it	418.23	/	0	zalando.nl	577	oponeo.pl	269.1	worten.pt	118.08	carrefour.es	486	ikea.com	299.52
7	2022	ikea.com	352.62	/	0	mediamarkt.nl	471.51	shein.com	268.47	hm.com	105.93	mercadona.es	460.8	netonnet.se	263.34
8	2023	esselungaacasa.it	349.74	/	0	apple.com	423.36	doz.pl	250.74	ikea.com	101.16	zalando.es	432	apoteket.se	241.92
9	2023	nike.com	303.3	/	0	wehkamp.nl	393.21	apple.com	226.71	elcorteingles.pt	82.44	zara.com	405.9	shein.se	232.56
10	2023	qvc.it	217.8	/	0	ikea.com	344.97	zalando-lounge.pl	204.21	nike.com	78.93	pccomponentes.com	400.5	mathem.se	209.43

Source: Statista, ecommerceDB, Similarweb.com, latvenergo.lv

Note: \*based on visits index in million instead of revenue

**Table 1.8: E-commerce coverage of top 10 e-merchants by net sales per country**

	AT	CZ	DK	FR	DE	EL	HU	IT	LV	NL	PL	PT	ES	SE
<b>Total coverage of e-commerce</b>	15.5%	22.4%	6.97%	10.4%	29.4%	/	8.91%	18.5%	/	23.3%	13%	16.4%	12.3%	10.7%
<b>Total number of online shops</b>	/	50.000	/	207.000	460.000	/	15.000	/	/	84.100	65.600	/	85.000	/

Source: Capgemini Research Institute for Financial Services Analysis, GlobalData, expert.de, webaruhazinditasa.hu, rynek-ksiazki.pl, puromarketing.com

For each of these e-merchants, every possible payment method that is presented to the customer is taken note of. As a result, the availability of each payment method per website and per country becomes visible. To ensure quality of data, the analysis has been performed multiple times.

The analysis was conducted separately for websites and apps. In calculating these rates, the weighted average (WA) for each payment method is used, given that in some countries, data are only available for the top 5 e-merchant platforms. The weighted average is calculated by the value of e-commerce in the countries to reflect the relative importance of each country in the total of e-commerce transactions. For instance, the availability of payment options in France would have a larger weight than in Denmark because the value of e-commerce in France is 146,900 million EUR and in Denmark it is 24,138 million EUR in the year 2022<sup>35</sup>. Note that the 'Online Banking' category includes SEPA Credit Transfers and all online banking and in-app payment applications and services such as iDEAL and Bizum. Direct Debit is initiated through the SEPA direct debit payment option.

A few assumptions were made to delineate the available payment methods. These are crucial because for consumers who execute a card transaction utilized by ICSs like Mastercard, their account will be debited. To illustrate, when a platform offers the option to pay with a 'payment card', then it is considered that both a credit and a debit transaction are possible, except for Germany. Conversely, if a platform specifies only credit card payment as an option, the store might be referring to card payments via the VISA or Mastercard network. In that case, both credit and debit cards are included. To specify, although a consumer clicks on the 'credit card' option, when using a VISA debit card, the payment will go through the VISA network, but the scheme will be debit rather than credit. When making a purchase online, customers can enter their Visa or Mastercard debit card information, including the card number, expiration date, and security code, to complete the transaction. The primary difference between Visa and Mastercard debit cards and credit cards lies only in how the transactions are debited, immediately or per due date. Notably, in Germany, online payments generally cannot be made using debit cards from local card schemes such as Girocard, consumers are able to purchase with an international debit card, but this can be counted as a credit card transaction in Germany. This is not the case for any other Members States. On the other hand, when a platform states that only debit card payments are available, then only debit card is taking into account. The following table presents the availability per country and the weighted average per payment method.

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<sup>35</sup> Capgemini Research Institute for Financial Services Analysis, GlobalData.

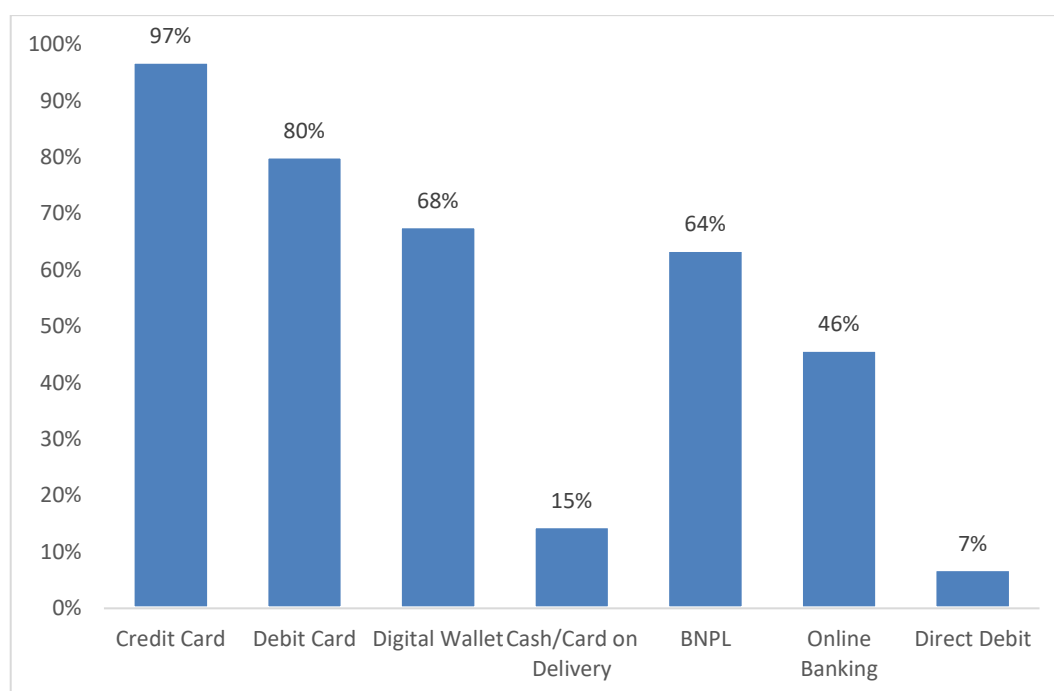
**Table 1.9: Availability rate of payment services on websites in e-commerce per country and their weighted average in 2024**

<b>Payment services on websites</b>	<b>Weighted Average</b>	<b>AT</b>	<b>CZ</b>	<b>DK</b>	<b>FR</b>	<b>DE</b>	<b>EL</b>	<b>HU</b>	<b>IT</b>	<b>LV</b>	<b>NL</b>	<b>PL</b>	<b>PT</b>	<b>ES</b>	<b>SE</b>
Credit Card(**)	<b>97%</b>	100%	100%	100%	100%	90%	100%	100%	100%	100%	80%	100%	100%	100%	100%
Debit Card(**)	<b>80%</b>	100%	100%	100%	90%	0%(**)	100%	100%	100%	100%	80%	100%	90%	100%	100%
Digital Wallet	<b>68%</b>	78%	70%	80%	60%	90%	80%	60%	70%	75%	30%	70%	70%	70%	40%
Cash/Card on delivery	<b>15%</b>	33%	80%	0%	0%	0%	40%	80%	30%	25%	30%	40%	0%	20%	10%
BNPL (*)	<b>64%</b>	89%	60%	50%	50%	100%	40%	60%	50%	50%	50%	50%	20%	60%	90%
Online banking	<b>46%</b>	44%	70%	10%	20%	80%	40%	40%	20%	75%	80%	90%	40%	40%	60%
Direct Debit	<b>7%</b>	22%	0%	0%	10%	20%	0%	0%	10%	0%	0%	0%	0%	0%	0%

Source: primary research

Note: (\*) has been added due to high availability of e.g. Pay per invoice or Klarna.

(\*\*) ICS debit schemes are covered under credit card scheme availability, except for Germany as there is no availability of GiroCard debit scheme for e-commerce.

**Figure 1.2: Weighted average of payment method availability rate on websites in selected EEA countries in 2024**

Source: primary research

Table 1.9 and Figure 1.2 present the availability rates of various payment methods on e-commerce websites across the selected EEA countries and their weighted average.

The weighted average availability of credit cards is 97%, indicating near-universal acceptance across all examined e-commerce platforms. Credit card is relatively low for The Netherlands because two grocery stores in the top 10 e-merchants table only accept debit card payments when purchasing the groceries online. The weighted average availability of debit cards is 80%, indicating a significant level of acceptance. The weighted average availability for debit cards is lower because for Germany the rate is 0%. Debit cards remain widely available in countries such as Denmark, Greece and Hungary, Spain, and Sweden, where their availability is 100%.

Digital wallets have a weighted average availability of 68%. This indicates that wallets are prevalent options on websites. Denmark and Germany have the highest availability rate of digital wallets, 80% and 90% respectively.

The provision of cash or card on delivery methods is less prevalent, with a weighted average of 15%, reflecting a limited availability in the e-commerce domain. Nevertheless, this payment method continues to retain availability in specific markets, such as Hungary, where its availability stands at 80%.

Online banking, for example initiated via PIS such as iDEAL or Bizum, has a weighted average availability of 46%, indicating that it has a moderate availability. This is probably because they have a large local coverage. It is notable that Online Banking is particularly available in Germany, the Netherlands and Poland. This is most likely because of the high availability of credit transfer (which has been counted in online banking) for Germany, and the iDEAL, BLIK and ePrzelewy options for respectively the Netherlands and Poland.

The lowest weighted average availability is observed for direct debit (e.g. SEPA) methods, at 7%. This indicates that the availability of these methods on e-commerce

websites is low and could be more just as part of a wallet solution, subscription or invoiced, e.g. via Klarna. Austria and Germany have the highest availability of direct debit, namely around 20%. Interesting to note it that the e-commerce platform Amazon offers direct debit as a payment option in Germany, Austria and France and makes up a large part of this percentage.

The identical methodology was employed to determine the availability of payment methods within apps. The app versions of the top 10 e-commerce platforms were analysed, which accounts to a total of 96 apps, as described in Table 1.10. Not every top e-commerce platform could be considered because for some platforms an app version does not exist, a customer ID or national phone number is needed, the app only serves as a catalogue, or the service was unavailable due to geo-blocking. This is the case for Greece, Hungary and Latvia, where less than 5 apps could be taken into account due to the restrictions. Table 1.11 and Figure 1.3 present the availability rates of various payment methods on e-commerce apps across the selected EEA countries and their weighted average<sup>36</sup>.

**Table 1.10: Analysed apps per country based on net sales**

AT	CZ	DK	FR	DE	EL	HU	IT	LV	NL	PL	PT	ES	SE
amazon.de	alza.cz	zalando.dk	amazon.fr	amazon.de	shein.com	emag.hu	amazon.it	220.lv	bol.com	mediaexpert.pl	shein.com	amazon.es	hm.com
zalando.at	rohlik.cz	apple.com	cdiscountry.com	otto.de	zara.com	kifli.hu	shein.com	Airbaltic.com	coolblue.nl	zalando.pl	continente.pt	elcorteingles.es	apple.com
ikea.com	datart.cz	hm.com	apple.com	zalando.de	praktiker.gr	alza.hu	apple.com	1a.lv	ah.nl	ikea.com	apple.com	shein.com	zalando.se
universal.at	czc.cz	boozt.com	auchan.fr	mediamarkt.de		tesco.hu	zalando.it		amazon.nl	oponeo.pl	hm.com	apple.com	ikea.com
mediamarkt.at	ikea.com	ikea.com	leroymerlin.fr	ikea.com			unieuro.it		jumbo.com	doz.pl	ikea.com	mediamarkt.es	shein.se
ottoversand.at	zalando.cz	matas.dk	zalando.fr	apple.com			mediaworld.it		zalando.nl	apple.com	nike.com	carrefour.es	mathem.se
apple.com	apple.com	asos.com		saturn.de			ikea.com		mediamarkt.nl	zalando-		mercadona.es	
bestsecret.at	notino.cz			lidl.de			esselungaa-		apple.com	lounge.pl		zalando.es	
	hm.com			aboutyou.de			casa.it		wehkamp.nl			zara.com	
				hm.com			nike.com		ikea.com			Pccomponen-	
												tes.com	

Source: primary research

<sup>36</sup> Local amazon sites are counted as different online retailers.

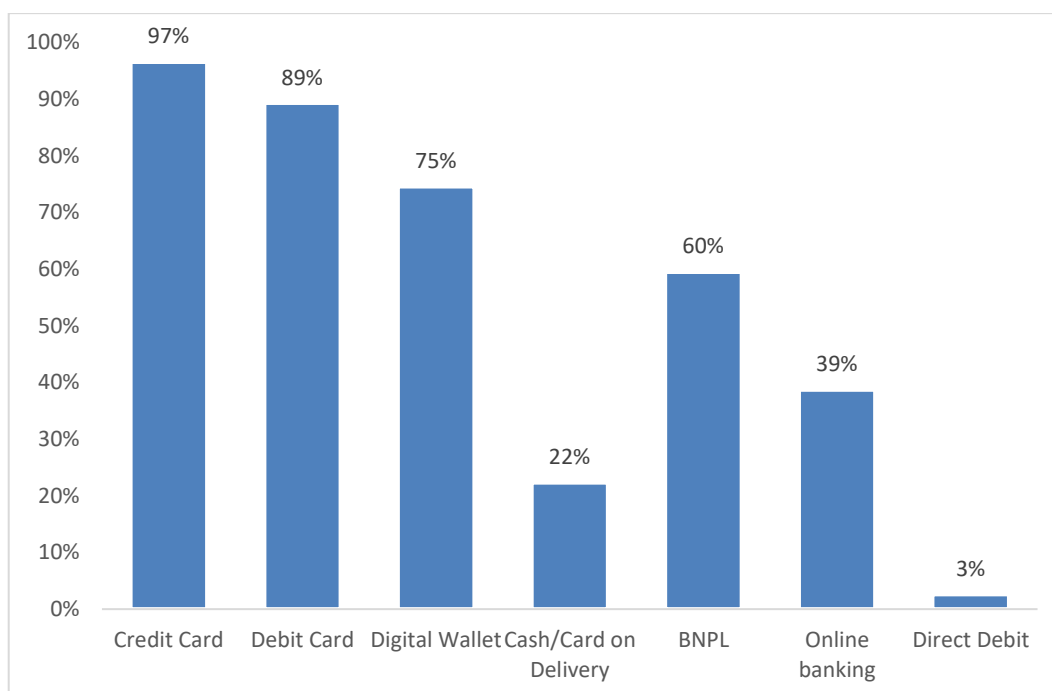
**Table 1.11: Availability rate of payment services on apps in e-commerce per country and their weighted average in 2024**

<b>Payment services on websites</b>	<b>Weighted Average</b>	<b>AT</b>	<b>CZ</b>	<b>DK</b>	<b>FR</b>	<b>GE</b>	<b>EL</b>	<b>HU</b>	<b>IT</b>	<b>LV</b>	<b>NL</b>	<b>PL</b>	<b>PT</b>	<b>ES</b>	<b>SE</b>
Credit Card	<b>97%</b>	100%	100%	100%	100%	90%	100%	75%	100%	100%	80%	100%	100%	100%	100%
Debit Card	<b>89%</b>	100%	100%	100%	100%	0%(**)	100%	75%	100%	100%	80%	100%	100%	100%	100%
Digital Wallet	<b>75%</b>	88%	67%	100%	83%	90%	67%	0%	78%	67%	50%	71%	50%	80%	83%
Cash/Card on delivery	<b>22%</b>	25%	78%	0%	0%	0%	33%	50%	11%	33%	20%	43%	0%	20%	0%
BNPL (*)	<b>60%</b>	88%	44%	57%	83%	80%	33%	100%	44%	100%	60%	43%	33%	40%	83%
Online banking	<b>39%</b>	38%	56%	0%	17%	80%	0%	50%	11%	100%	70%	86%	17%	50%	17%
Direct Debit	<b>3%</b>	13%	0%	0%	0%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Source: primary research

Note: (\*) has been added due to high availability of e.g. Pay per invoice or Klarna.

(\*\*) ICS debit schemes are covered under credit card scheme availability, except for Germany as there is no availability of GiroCard debit scheme for e-commerce

**Figure 1.3: Weighted average of payment method availability rate on apps in selected EEA countries in 2024**

Source: primary research

Like websites, credit cards have the highest availability on apps, followed by debit cards. Credit card availability rates remain consistent across platforms. Also, the weighted average availability for debit cards is lower because for Germany the rate is 0%. Digital wallets, however, are more commonly available on apps than on websites, likely due to the prevalence of payment methods like Apple Pay and Google Pay. On apps the digital wallet has an average weighted availability rate of 75%, while on websites it is 68%. Denmark leads in digital wallet availability with 100%, followed by Germany at 90% and Austria at 88%.

Cash/card on delivery also shows higher availability on apps, there is an 8% increase in availability compared to websites. There is significant variation between countries. For instance, Hungary offers 100% availability for this payment method, while several countries, including France and Sweden, have 0%. This pattern is reflected on websites as well.

BNPL, online banking, and direct debit have lower availability on apps compared to websites. For example, on Apple's app version of its web shop, BNPL is not available in some countries, while it is offered on the website. On the other hand, online banking may have lower app availability due to the specific apps analysed. There appears to be a correlation between apps with geo-blocking and online banking, as seen with apps from IKEA, Zara, and Shein.

These conclusions are further corroborated with the analysis of questionnaires' results and the findings of consumer survey.

### 1.3. State of play and evolution of the online payments market in selected EEA countries

This section outlines the various consumer usage patterns in online shopping, set against the backdrop of e-commerce transaction values in selected EEA countries, considering the period from 2018 to 2022. It focuses on the value and volume of credit and debit card transactions and starts with the preferred devices that consumers use, making distinctions between desktop, smartphone, and tablet. It then describes the value of transactions conducted via desktop, app, and mobile web browsers.

The analysis of device usage for online shopping in different countries was created through the evaluation of various reports and statistics from different data sources, providing comprehensive insights into consumer preferences and trends in Europe. The split between browser use and in-app purchases is derived from a survey on buyer behaviour conducted by Global Data, offering detailed information on how shoppers choose their preferred platforms for online purchases. These combined data sources provide insights on the global online shopping landscape, highlighting the information about regional differences and user habits.

The interpretation of the absolute volumes and values in e-commerce presented in the tables requires consideration of the population size of the respective countries. Countries with larger populations generally exhibit higher total volumes and values, as the number of potential buyers and transactions is directly influenced by the population size. Differences in absolute figures therefore reflect not only economic or structural factors but are also significantly shaped by the size of the respective population. For a clearer understanding of the presented volumes and values, the following table of population figures can be used as an additional reference to account for the relation to population size.

**Table 1.12: Population by country in millions**

Country	Population
Austria	9,1
Czechia	11,05
Denmark	5,96
France	68,47
Germany	85,04
Greece	10,37
Hungary	9,67
Italy	59,01
Latvia	2,88
Netherlands	17,96
Poland	38,56
Portugal	10,39
Spain	48,35
Sweden	10,64

Sources: Statista

The following table provides an overview of preferred used devices for e-commerce across various European countries, based on data from the years 2022 and 2023. The

statement on the preferred device is shown: the use of other devices or a double nomination is not excluded<sup>37</sup>.

**Table 1.13: Device stated preference**

	Desktop	Smartphone	Tablet
<b>Average*</b>	<b>59%</b>	<b>48%</b>	<b>18%</b>
Austria	53%	37%	11%
Czechia	49%	47%	4%
Denmark	37%	41%	12%
France	24%	81%	10%
Germany	45%	64%	25%
Greece	90%	4%	4%
Hungary	56%	44%	44%
Italy	69%	35%	25%
Latvia	91%	68%	9%
Netherlands	51%	35%	12%
Poland	69%	79%	16%
Portugal	56%	24%	24%
Spain	77%	65%	14%
Sweden	59%	41%	41%

Sources: Statista, Klarna, Eurotext, Go-Globe, Dansk Industri, FEVAD, Google, Gemius, IAB Spain

Note: \* Average is recalculated based on the population

The table also provides average values for device preferences across the 14 countries, offering insights into broader e-commerce trends in Europe. On average, 59% of consumers prefer to shop on desktops, indicating a significant reliance on traditional computer-based shopping. Smartphones follow closely with 48%, emphasizing the growing importance of mobile optimization. Tablets account for 18% of usage. The table reveals significant differences in preferred e-commerce devices across various countries. While some markets, like Latvia, show a strong preference for desktops, others, like France and Spain, are dominated by smartphones. Countries like Germany and Sweden exhibit a balanced usage across different devices.

Certain countries stand out due to their strikingly unique preferences. For instance, Latvia shows a dominant preference for desktops at 91%, the highest in the table, while smartphones and tablets are used by 68% and 9% of users, respectively. Conversely, France demonstrates a strong inclination towards smartphones, 81% of the consumers would use a smartphone for their e-commerce activities. Desktops account for only 24% and tablets a mere 10%. Spain follows a similar trend, with 65% of consumers using smartphones, although desktops also play a substantial role at 77%.

<sup>37</sup> With the exception for Greece where we currently only found data from 2015.

In Germany, 45% of users prefer desktops, 64% smartphones, and 25% tablets, while in Sweden, the distribution is 59% for desktops, and 41% each for smartphones and tablets. Hungary stands out with an equal usage preference of desktops and tablets at 56% and 44%, respectively, alongside a significant smartphone usage at 44%.

**Table 1.14: Split between in-app and browser payments for 2022, in million EUR**

Country	Payment Instruments	Absolute values	Relative values
Austria	Total Online Commerce	14,433	-
	Desktop Browser <sup>38</sup>	6,980*	48.36%
	Mobile Payments in apps <sup>39</sup>	4,343*	30.09%
	Mobile Web Browser	3,110*	21.54%
Czechia	Total Online Commerce	11,026	-
	Desktop Browser	5,700*	51.69%
	Mobile Payments in apps	3,152*	28.58%
	Mobile Web Browser	2,175*	19.72%
Denmark	Total Online Commerce	24,138	-
	Desktop Browser	10,968	45.44%
	Mobile Payments in apps <sup>40</sup>	6,347	26.29%
	Mobile Web Browser	6,823	28.27%
France	Total Online Commerce	146,900	-
	Desktop Browser	110,032	74.90%
	Mobile Payments in apps	22,674	15.43%
	Mobile Web Browser	14,194	9.66%
Germany	Total Online Commerce	101,651	-
	Desktop Browser	59,843	58.87%
	Mobile Payments in apps	23,204	22.83%
	Mobile Web Browser	18,605	18.30%
Greece	Total Online Commerce	12,599	-
	Desktop Browser	7,665*	60.84%
	Mobile Payments in apps	2,830*	22.46%
	Mobile Web Browser	2,104*	16.70%
Hungary	Total Online Commerce	6,921	-
	Desktop Browser	4,433*	64.06%

<sup>38</sup> Desktop Browser is the personal computer the customer is using.

<sup>39</sup> Includes tablets and smartphones.

<sup>40</sup> Includes tablets and smartphones.

	Mobile Payments in apps	936*	21.11%
	Mobile Web Browser	1,027*	14.84%
	Total Online Commerce	48,060	-
Italy	Desktop Browser	20,281	42.20%
	Mobile Payments in apps	17,518	36.45%
	Mobile Web Browser	10,261	21.35%
	Total Online Commerce	577	-
Latvia	Desktop Browser	299*	51.90%
	Mobile Payments in apps	160*	27.80%
	Mobile Web Browser	117*	20.30%
	Total Online Commerce	33,300	-
Netherlands	Desktop Browser	20,979	63.00%
	Mobile Payments in apps	6,345	19.05%
	Mobile Web Browser	5,976	17.95%
	Total Online Commerce	28,700	-
Poland	Desktop Browser	17,743	61.82%
	Mobile Payments in apps	6,393	22.28%
	Mobile Web Browser	4,564	15.90%
	Total Online Commerce	8,200	-
Portugal	Desktop Browser	4,125*	50.30%
	Mobile Payments in apps	2,530*	30.86%
	Mobile Web Browser	1,545*	18.84%
	Total Online Commerce	83,859	-
Spain	Desktop Browser	38,122	45.46%
	Mobile Payments in apps	27,227	32.47%
	Mobile Web Browser	18,510	22.07%
	Total Online Commerce	29,134	-
Sweden	Desktop Browser	14,789	50.76%
	Mobile Payments in apps	7,963	27.33%
	Mobile Web Browser	6,382	21.91%

Source: GlobalData

Note: (\*) This data is unavailable, and an estimation has been calculated by means of the methodology in the Annex B.

The provided data on e-commerce transaction values<sup>41</sup> for 2022 across various countries highlights the diverse patterns consumers engage with online shopping through Desktop Browser, In-app Mobile Payments, and Mobile Web Browser.

France stands out with the highest values, particularly in Desktop Browser transactions at 110,032 million EUR. Interestingly, Table 1.13 states that France has a high preference for smartphone usage for ecommerce. It is possible that small and frequent purchases are made on the smartphone, but purchases with a large amount are made via the desktop browser. Germany has the second highest value of 59,843 million EUR. Both countries also show substantial figures for In-app Mobile Payments and Mobile Web Browser transactions. The Desktop Browser transactions in France account for almost 75%.

Additionally, the Netherlands also demonstrates more of an affinity to use desktops, e.g. the Desktop Browser transactions account for 63%, with lower values for In-app Mobile Payments and Mobile Web Browser, for 19.05% and 17.95% respectively.

Other countries, like Italy and Spain, show a lower share of desktop browser transactions, accounting for 42.20% and 45.46%, respectively. In these cases, the value from Mobile Payments in apps and Mobile Web Browser payments is relatively higher.

Portugal and Sweden present a mixed picture. Portugal shows a preference for Desktop Browser transactions for 50.30%, but also has notable figures for In-app Mobile Payments and Mobile Web Browser transactions, for 30.86% and 18.84% respectively. Sweden, too, has a balanced distribution with Desktop Browser for 50.76%, In-app Mobile Payments for 27.33%, and Mobile Web Browser transactions for 21.91%.

In summary, the data underscores the varied e-commerce landscapes across Europe. France and Germany lead with high transaction values across all platforms, the Netherlands and France have the highest relative value for desktop payments, and Italy has the highest relative value for Mobile Payments in apps. Portugal and Sweden display a balanced mix of desktop and mobile transaction values.

### 1.3.1. Evolution of online payments

The data for this part is based on the following sources: (1) the Capgemini Research Institute for Financial Services Analysis (2) the ECB Statistical Data Warehouse (3) the BIS Statistics Explorer as well as (4) annual reports from various countries' central banks. These provide comprehensive datasets essential for constructing detailed tables that underpin the analysis. The volume of payment methods is indicated in million EUR. However, for countries where data was missing, the dataset is supplemented by calculating and comparing similar metrics from analogue countries. The Project Team has construed a methodology to calculate the value even if there is no data available. The figures from the tables in section 1.3.1 do not cover 100% of all e-commerce transactions, as they only show the four most important payment services (total revenue in the B2C e-commerce market in Europe increased from EUR 313.4 billion in 2018 to EUR 522.3 billion in 2022)<sup>42</sup>: credit transfer, direct debit, credit card and debit card. The data is based on primary data on the total volume of e-commerce and m-

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<sup>41</sup> Data on transaction volumes has not been found.

<sup>42</sup> Statista, "E-commerce in Europe", (2024), Accessible via: <https://de.statista.com/statistik/studie/id/23510/dokument/e-commerce-in-europa-statista-dossier/>.

commerce in the respective countries in 2022. The distribution among the individual payment services is based on the distribution in Table 1.6. The data provided for the past growth is based on Capgemini's world payment report cross-checked by Capgemini payment experts and where needed, secondary sources. Where no data was found presumptions have been made based on the Compound Annual Growth Rate (CAGR). Other transactions that are not covered by the four payment services shown include cash on delivery and checks.<sup>43</sup> Some National solutions like that are often used like, Blik in Poland, MB WAY in Portugal or e-Postepay in Italy are also not covered.

**Table 1.15: Value of credit transfer e-commerce transactions in million EUR**

Country	2018	2019	2020	2021	2022
<b>Total</b>	70,078	73,097	79,211	90,123	101,656
Austria	1,879	2,042	2,068	2,435	2,710
Czechia	2,174	2,323	2,353	2,452	2,548
Denmark	2,532	2,583	2,598	3,142	3,399
France	16,332	17,465	22,055	25,324	28,646
Germany	19,154	20,283	21,050	22,784	24,498
Greece	1,492	1,656	1,702	1,751	1,814
Hungary	2,057	2,016	2,143	2,522	2,921
Italy	4,924	4,622	4,141	4,639	5,109
Latvia	235	210	186	227	244
Netherlands	1,352	1,374	1,513	2,528	4,332
Poland	5,364	5,778	6,885	8,243	9,382
Portugal	466	489	487	541	591
Spain	7,126	7,212	6,918	7,553	8,344
Sweden	4,991	5,044	5,112	5,982	7,118

Source: Capgemini Research Institute

Overall, there is a steady increase in transaction values, rising from 70,078 million EUR in 2018 to 101,656 million EUR in 2022. Germany shows one of the highest transaction values over this period, rising from 19,154 million EUR in 2018 to 24,498 million EUR in 2022. France and the Netherlands also stand out, with significant growth in transaction values. France sees an increase from 16,332 million EUR in 2018 to 28,646 million EUR in 2022, while the Netherlands sees a particularly notable increase from 1,352 million EUR in 2018 to 4,332 million EUR in 2022. Other countries such as Austria, Poland and Spain also show growth trends. Austria's transaction value has grown from 1.879 million EUR in 2018 to 2,710 million EUR in 2022, and Poland's from 5,364 million EUR in 2018 to 9,382 million EUR in 2022.

<sup>43</sup> (1) Wallet transactions are not included. (2) The data available does not make the distinction on whether consumers pay with coins / bank notes or with cards via a portable POS terminal when goods are delivered at the door.

**Table 1.16: Transaction value of e-commerce direct debit in million EUR**

Country	2018	2019	2020	2021	2022
<b>Total</b>	31,249	32,297	30,811	33,542	36,190
Austria	477	541	605	783	912
Czechia	49	50	44	42	42
Denmark	1,687	1,704	1,699	1,720	1,757
France	2,171	2,265	2,229	2,508	2,791
Germany	16,878	17,205	16,088	17,301	18,297
Greece	97	107	95	121	134
Hungary	0	0	0	0	0
Italy	975	1,005	932	1,122	1,312
Latvia	0	0	0	0	0
Netherlands	3,251	3,358	3,215	3,469	3,773
Poland	512	518	459	427	442
Portugal	5	5	5	6	7
Spain	970	1,066	876	1,008	1,115
Sweden	4,177	4,473	4,564	5,035	5,608

Source: Capgemini Research Institute

The total value of transactions increases from 31,249 million EUR in 2018 to 36,190 million EUR in 2022. Germany consistently holds the highest transaction value, with an increase from 16,878 million EUR in 2018 to 18,297 million EUR in 2022. Netherlands follows with an increase from 3,251 million EUR in 2018 to 3,773 million EUR in 2022. Austria also shows significant growth, with values increasing from 477 million EUR in 2018 to 912 million EUR in 2022. Other countries such as Italy, Spain and France show similar positive trends. Italy's transaction values increased from 975 million EUR in 2018 to 1,312 million EUR in 2022, while Spain's values increased from 970 million EUR to 1,115 million EUR over the same period. France saw an increase from 2,171 million EUR in 2018 to 2,791 million EUR in 2022.

**Table 1.17: Value of credit card e-commerce transactions in million EUR**

Country	2018	2019	2020	2021	2022
<b>Total</b>	92,772	100,829	100,073	114,436	126,591
Austria	1,880	2,019	2,062	2,320	2,781
Czechia	382	434	497	642	782
Denmark	5,610	5,916	5,866	6,398	6,971
France	38,607	41,270	39,658	44,932	49,212
Germany	10,429	11,636	12,075	13,057	14,028
Greece	1,954	2,213	3,104	3,781	4,373
Hungary	215	264	304	370	496
Italy	6,019	6,597	6,598	7,918	9,026
Latvia	66	73	71	85	98
Netherlands	4,155	4,314	3,855	4,002	4,282
Poland	1,203	1,433	1,575	1,904	2,276
Portugal	685	652	646	755	850
Spain	17,817	20,094	20,199	24,397	27,145
Sweden	3,750	3,914	3,563	3,875	4,271

Source: Capgemini Research Institute

The above data shows that France shows the highest transaction values, with an increase from 38,607 million EUR in 2018 to 49,212 million EUR in 2022. Spain follows, with values increasing from EUR 17,817 million in 2018 to EUR 27,145 million in 2022. Italy also shows significant growth, with transaction values increasing from 6,019 million EUR in 2018 to 9,026 million EUR in 2022. Germany also shows a notable increase, with values rising from 10,429 million EUR in 2018 to 14,028 million EUR in 2022. Other countries such as Austria, Denmark and the Netherlands show positive trends. Austria's transaction values grow from 1,880 million EUR in 2018 to 2,781 million EUR in 2022, Denmark's from 5,610 million EUR to 6,971 million EUR, and the Netherlands from 4,155 million EUR to 4,282 million EUR over the same period.

**Table 1.18: Value of debit card e-commerce transactions in million EUR**

Country	2018	2019	2020	2021	2022
<b>Total</b>	46,472	50,591	50,505	58,548	65,330
Austria	596	640	653	735	881
Czechia	567	644	738	952	1,160
Denmark	1,849	1,950	1,934	2,109	2,298
France	19,937	21,312	20,480	23,204	25,414
Germany	756	843	875	946	1,017
Greece	1,688	1,912	2,681	3,265	3,777
Hungary	330	406	468	568	762
Italy	3,295	3,611	3,612	4,334	4,941
Latvia	47	52	51	61	71
Netherlands	1,315	1,365	1,220	1,266	1,355
Poland	1,466	1,745	1,919	2,319	2,772
Portugal	695	662	655	766	862
Spain	10,793	12,173	12,237	14,780	16,445
Sweden	3,138	3,276	2,982	3,243	3,575

Source: Capgemini Research Institute

For debit card transactions there is a significant upward trend in total transaction values, increasing from 46,472 million EUR in 2018 to 65,330 million EUR in 2022. France consistently records the highest transaction values, rising from 19,937 million EUR in 2018 to 25,414 million EUR in 2022. Italy also shows notable growth, with transaction values rising from 3,295 million EUR in 2018 to 4,941 million EUR in 2022. Spain's values also increase significantly, from 10,793 million EUR in 2018 to 16,445 million EUR in 2022. Other countries such as Austria and Poland also show positive trends. Austria's value increase from 596 million EUR in 2018 to 881 million EUR in 2022, while Poland's value increase from 1,466 million EUR to 2,772 million EUR.

**Table 1.19: Volume of credit transfer e-commerce transactions in millions**

Country	2018	2019	2020	2021	2022
<b>Total</b>	722	778	812	890	941
Austria	14	14	15	16	16
Czechia	43	45	45	49	51
Denmark	33	36	36	39	40
France	177	187	196	212	222
Germany	154	159	164	170	170
Greece	16	17	23	23	22
Hungary	22	24	25	28	29
Italy	39	41	43	47	49
Latvia	9	10	10	11	11
Netherlands	32	35	36	41	45
Poland	46	51	59	68	77
Portugal	6	6	6	7	7
Spain	83	104	97	116	134
Sweden	48	49	57	63	68

Source: Capgemini Research Institute

During the 2018-2022 period, the total number of credit transfer transactions increases steadily from 722 million in 2018 to 941 million in 2022. France consistently reports the highest number of transactions, with an increase from 177 million in 2018 to 222 million in 2022. Germany follows with an increase from 154 million transactions in 2018 to 170 million in 2022. Spain also shows significant growth, with transactions increasing from 83 million in 2018 to 134 million in 2022. Poland shows a notable increase, with numbers rising from 46 million in 2018 to 77 million in 2022. Other countries such as Austria, Denmark and Italy also show positive trends. Austria's transactions increase from 14 million in 2018 to 16 million in 2022, Denmark's from 33 million to 40 million, and Italy's from 39 million to 49 million over the same period.

**Table 1.20: Volume of direct debit e-commerce transactions in millions**

Country	2018	2019	2020	2021	2022
<b>Total</b>	268	278	293	304	305
Austria	5	5	5	5	5
Czechia	1	1	1	1	1
Denmark	22	22	22	22	21
France	17	18	19	21	22
Germany	117	121	128	129	127
Greece	2	2	2	2	2
Hungary	0	0	0	0	0
Italy	10	10	11	12	13
Latvia	0	0	0	0	0
Netherlands	33	35	36	38	39
Poland	4	3	3	4	4
Portugal	0	0	0	0	0
Spain	17	16	16	17	18
Sweden	40	45	50	53	53

Source: Capgemini Research Institute

The total number of transactions increases, starting at 268 million in 2018 and reaching 305 million in 2022. Germany leads with the highest number of transactions, peaking at 129 million in 2021, before declining slightly to 127 million in 2022. France shows a consistent upward trend, increasing from 17 million in 2018 to 22 million in 2022. Italy's direct debit transactions also increase, from 10 million in 2018 to 13 million in 2022. The Netherlands maintains steady growth, with the number of transactions increasing from 33 million in 2018 to 39 million in 2022. Spain and Sweden also show positive trends. Spain's transactions will increase from 17 million in 2018 to 18 million in 2022 and Sweden's increase from 40 million to 53 million.

**Table 1.21: Volume of credit card e-commerce transactions in millions**

Country	2018	2019	2020	2021	2022
<b>Total</b>	820	928	947	1.121	1.295
Austria	10	12	13	15	17
Czechia	8	10	11	13	16
Denmark	76	81	79	82	83
France	282	310	295	341	381
Germany	59	70	83	92	97
Greece	17	22	31	41	53
Hungary	3	3	3	4	5
Italy	40	45	44	63	87
Latvia	4	4	5	5	5
Netherlands	45	49	46	46	45
Poland	10	13	13	16	19
Portugal	8	8	8	9	10
Spain	218	259	277	354	436
Sweden	40	42	39	40	41

Source: Capgemini Research Institute

The table shows the number of credit card transactions in e-commerce, measured in millions, from 2018 to 2022. During this period, the total number of transactions did increase significantly, from 820 million in 2018 to 1.295 million in 2022. France records one of the highest number of transactions, growing from 282 million in 2018 to 381 million in 2022. Spain also shows a significant increase, with transaction numbers rising from 218 million in 2018 to 436 million in 2022. Denmark follows, with the number of transactions increasing from 76 million in 2018 to 83 million in 2022. Italy also experiences notable growth, with an increase from 40 million transactions in 2018 to 87 million in 2022. Other countries such as Austria, Poland and Greece also show positive trends. Austria's transactions increase from 10 million in 2018 to 17 million in 2022, Poland's from 10 million to 19 million, and Greece's from 17 million to 53 million.

**Table 1.22: Volume of debit card e-commerce transactions in millions**

Country	2018	2019	2020	2021	2022
<b>Total</b>	435	492	501	607	709
Austria	3	4	4	5	5
Czechia	12	14	16	20	23
Denmark	25	27	26	27	27
France	146	160	152	176	197
Germany	4	5	6	7	7
Greece	15	19	27	36	46
Hungary	4	5	5	6	8
Italy	22	25	24	35	48
Latvia	3	3	3	3	3
Netherlands	14	15	14	15	14
Poland	13	15	16	20	23
Portugal	8	8	8	9	10
Spain	132	157	168	214	264
Sweden	34	35	32	34	34

Source: Capgemini Research Institute

France stands out with one of the highest number of transactions, increasing from 146 million in 2018 to 197 million in 2022. Spain, however, is showing greater growth from 132 million in 2018 to 264 million in 2022. Italy shows a notable increase in transactions, rising from 22 million in 2018 to 48 million in 2022. Greece also shows a significant increase, from 15 million transactions in 2018 to 46 million in 2022. Other countries, such as Czechia, Poland and Hungary, show positive trends. Czechia's transactions increase from 12 million in 2018 to 23 million in 2022, Poland's from 13 million to 23 million, and Hungary's from 4 million to 8 million.

### 1.3.2. Growth rate of payment methods

With the above evolution in payment methods for 2018 until 2022 in mind, below an estimate is made of the growth rate of the most used payment methods for 2023 until 2025, based on value.

**Table 1.23: growth rate of most used payment methods**

Payment Method	CAGR (2023-2025)
Credit Transfer	4.04%
Credit or Charge Card	12.08%
Debit Card	7.76%
Amazon Pay	18.26%
Apple Pay	32.31%
Google Pay	14.02%

Source: Capgemini Research Institute

The aforementioned data suggest that the online payment market grew over the past years and will continue to do so in the near future. The fastest growing payment method will be Apple Pay, followed by Amazon Pay.

### 1.3.3. Online payment trends

The (online) payment landscape has undergone significant transformations in Europe over the past few decades, driven by technological advancements, changing consumer preferences, COVID-19 and evolving regulatory frameworks. From the advent of credit cards in the mid-20th century to the rise of digital wallets in the 21st century, the methods of payment have continuously evolved. This chapter aims to explore the key changes in the payment landscape that may or may not have left a marked impact on payments. By doing so it focuses on the drivers of these changes, their implications and the future trends that are likely to shape the industry.

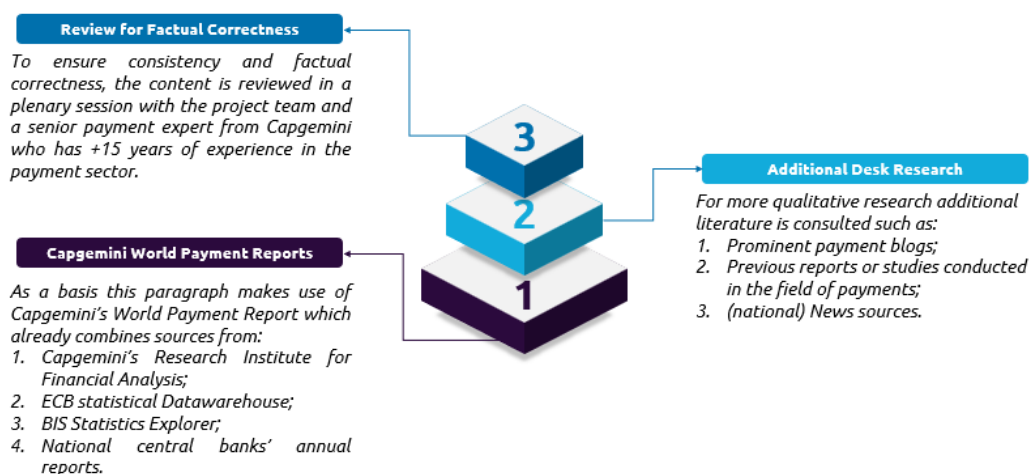
By examining the shift from traditional payment methods to digital solutions, the increasing importance of security and privacy, and the role of fintech innovations, this chapter provides a comprehensive overview of how payments are transforming in a rapidly digitizing world.

The next section provides an overview of major historical changes in the payments industry since 1950. This section mainly focuses as a backdrop for the following ones, as it serves to detail the payment narrative, namely: an increased digitization in the payments industry.

Section 1.3.5 then builds further on the presets identified in section 1.3.4 but looking whether these habits have persisted and how other emerging trends have started to gain traction.

The methodology for this section follows three steps (see Figure 1.4 below). As a starting point for data collection, this report uses Capgemini's World Payment reports. These reports make use of Capgemini's Research Institute for Financial Analysis as well as the ECB Statistical Data Warehouse and the BIS Statistics Explorer, combined with the annual reports of the national central banks. The second step, especially for more qualitative research, is to draw on additional literature, such as prominent payments blogs and reports from stakeholders active in the payments sector. Finally, the content is reviewed by a senior payments expert from Capgemini to ensure consistency and accuracy.

**Figure 1.4: Methodology for identifying past and future payment trends**



Source: Project Team's own Elaboration

#### **1.3.4. Historical changes in the (online) payment landscape since 1950**

This paragraph explores some of the most noticeable events happening in the payment industry. In order to provide a historical overview of pivotal events, the year 1950 is used as a benchmark. This year marks the introduction of the most prevalent payment option, the payment card, which coincides with the post-WWII economic boom. Due to the significance, an overview of the regulatory changes is given further down the paragraph. Here, the focus will be on the different regulations that came into force starting in 2007 with the first Payment Services Directive.

##### **1.3.4.1. The evolution of the European (online) payment sector, payment cards & the dawn of the digital age**

Across Europe, approximately 544 million payment transactions (comprising around 404 million card payments and 140 million SEPA transfers) are conducted daily by roughly 742 million residents through about 8,300 credit institutions. The majority, over 97% of these transactions, are processed domestically, with only a small portion involving cross-border transactions. Another characteristic of the European payment market, including the online market, is its high complexity and fragmentation, particularly evident in national differences regarding market participants, usage of payment instruments, national infrastructures, and individual market growth rates of non-cash payment instruments. Despite double-digit growth rates of non-cash payments, cash payments remain a significant factor in retail transactions across all selected EEA, with the number of individual transactions and transaction volumes varying significantly by country. The most significant non-cash payment services in e-payments in Europe include payment cards, credit transfers and direct debits. Like cash payments, there are also diverse cultural practices in the use of non-cash instruments. For instance, credit transfers are dominant in Eastern European countries, whereas payment cards are the preferred payment method in Central Europe. The widely varying distribution of non-cash payment instruments can be attributed to national factors, including legal requirements such as the national authorization of electronic direct debit (ELV) in Germany, bank density, or different national account types. These differences in the usage of non-cash instruments in individual countries are highlighted, for example, in the Statistical Data Warehouse of the ECB and the World Payment Report by Capgemini. For example, in Germany, credit transfer and direct debit dominate the national payment market. Conversely, in countries like Portugal, or Greece, card payments account for approximately 60% (Portugal), and 55% (Greece) of the total market transactions in 2022.<sup>44</sup>

Regarding cards, the introduction of the first modern credit card in the USA, the Diners Club Card (50') allowed consumers for the first time to make purchases on credit, therefore changing the way people paid for goods and services.<sup>45</sup> This introduction also coincides with the post-World War II economic boom, which drove increased consumer spending across Europe. Other game changing innovations in the payment industry took

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<sup>44</sup> S. Huch, "Die Transformation des Europäischen Kartengeschäfts: Auswirkungen der Liberalisierung und Harmonisierung des EU-Zahlungsverkehrs", (2023), Capgemini Research 2024, Capgemini World Payment Report series 2023-2025.

<sup>45</sup> Diner Club International, "The Story Behind The Card," (2024), Accessible via: <https://www.dinersclubus.com/home/about/dinersclub/story#:~:text=February%201950.,world's%20first%20multipurpose%20charge%20card>.

place in 1958 when the Bank of America launched a consumer credit card program with a Card titled "BankAmericard" (that later would be dubbed "Visa" in 1976).<sup>46</sup>

A few years later in 1964, Eurocard was established in the EU by Europay International, with the aim of creating a homogeneous European credit card system.<sup>47</sup> Almost four decades later, in 2002 Europay merged with MasterCard International.<sup>48</sup>

The dawn of the internet marks one of the most important events in the history of the modern-day payment industry, fundamentally transforming how financial transactions are conducted. From its early introduction in the 1980s to its widespread commercialization in the late 1990s<sup>49</sup>, the internet has driven significant innovations and changes in payment methods:<sup>50</sup>

1. In 1994, First Virtual Holdings (San Diego, CA) created the first online payment system that allowed for online credit card transactions.<sup>51</sup>
2. Between 1995-1998, banks in Northern Europe, such as Merita Bank (now part of Nordea) and Svenska Handelsbanken, began offering online banking services. This development was influenced by the high internet penetration rates in Scandinavian countries, which facilitated the early adoption and growth of digital banking services.<sup>52</sup>
3. Between 1998 and 2000, various online payment platforms were introduced, such as Paypal, which enabled users to send and receive money online by using an email address linked to a bank account or credit card.<sup>53</sup>
4. Since 2015, Big Techs entered with digital wallets, including Apple, Google and Amazon:

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<sup>46</sup> National Museum of American History, "First & Merchants BankAmericard Visa", (1978), Accessible via: [https://americanhistory.si.edu/collections/object/nmah\\_1444151#:~:text=In%201976%20BankAmericard%20officially%20became%20branded%20as%20a%20Visa%20card](https://americanhistory.si.edu/collections/object/nmah_1444151#:~:text=In%201976%20BankAmericard%20officially%20became%20branded%20as%20a%20Visa%20card).

<sup>47</sup> Actua Banque, "Eurocard, un format standardisé au cœur de l'histoire de la carte de crédit", Accessible via: <https://www.actubanque.fr/eurocard-un-format-standardise-au-coeur-de-lhistoire-de-la-carte-de-credit/>.

<sup>48</sup> Bank Systems & Technology, "MasterCard And Europay Merge To Form A Global Payments Company", (2002), Accessible via: <https://www.banktech.com/payments/mastercard-and-europay-merge-to-form-a-global-payments-company/d/d-id/1288945.html>; In the publication of the European Journal of 13<sup>th</sup> of April 2002 it is stated that, at the time, apart from Europay, there were four other main "international payment organisations" active being: "Visa International, Japan Credit Bureau (JCB) and the international proprietary systems American Express and Diners Club International." Mastercard at that time was able to be active in the EU because of its alliance with Europay where Visa was its main competitor. See: *Official Journal of the European Communities*, C89/8 of 13 March 2002, Accessible via: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:C:2002:089:FULL>.

<sup>49</sup> National Science Foundation, "Birth of the Commercial Internet", (2024), Accessible via: <https://new.nsf.gov/impacts/internet>.

<sup>50</sup> This list of examples serves as outline for main changes but is not exhaustive.

<sup>51</sup> Sid L. Huff & Mike Wade, "Business Case: First Virtual Holdings, Inc. (A)", Harvard Business Review, (1997), Accessible via: <https://store.hbr.org/product/first-virtual-holdings-inc-a/98E007#:~:text=Source%3A%20Ivey%20Publishing-,First%20Virtual%20Holdings%2C%20Inc.,and%20services%20over%20the%20Internet>.

<sup>52</sup> The Paypers, "The Evolution of the bank account: The rise of the Internet and Online Banking", (2017), Accessible via: <https://thepayers.com/expert-opinion/the-evolution-of-the-bank-account-part-iii-the-rise-of-the-internet-and-online-banking--770921>.

<sup>53</sup> FinTech Magazine, "The Story of Paypal: The World's Most valuable Fintech Firm", (2022), Accessible via: <https://fintechmagazine.com/digital-payments/story-Paypal-worlds-most-valuable-fintech-firm>.

- a. Amazon Pay: Amazon announced it would expand its Amazon Pay business to France, Italy and Spain in 2017.<sup>54</sup>
- b. Google Pay: Google released its online payment functionality, Android Pay, in 2015. In 2018, Google rebranded it as Google Pay by merging it with the earlier Google Wallet, which had been launched in 2011. The merge would cause users to use both online and offline payment features in one app. It was introduced in Germany first in 2018 where it allowed Android users to use their app for contactless payments.<sup>55</sup> Regarding online payments, Google Pay was already available worldwide across various online merchants.<sup>56</sup>
- c. Apple Pay: Apple launched its mobile payment service in 2014, enabling users to make contactless payments using their iPhones, iPads, and Apple Watches.<sup>57</sup> The service expanded globally, gradually rolling out across markets. In Europe Apple Pay was first introduced with its launch in the United Kingdom in July 2015<sup>58</sup>, followed by France in July 2016<sup>59</sup>. Belgium joined in November 2018<sup>60</sup>, and by June 2019, the service had expanded to 13 more European countries, including Portugal, Greece, and Romania.

The introduction of the smartphone around 2010 further accelerated the transformation of the payment industry. Combining the usage of the internet and the omnipresence of handheld devices, smartphones provide a platform for different payment modalities such as (1) Mobile wallets, (2) Near Field communication (NFC) and (3) Mobile Peer-to-peer transfers, to name a few of the most prominent examples.

Both the commercialization of the Internet in the 1990s and the advent of smartphones have positioned the payments industry as a driver of innovation in both e- and m-commerce.

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<sup>54</sup> GlobalData, "Amazon Pay – Competitor Profile", (2024), Accessible via: <https://www.globaldata.com/store/report/amazon-pay-competitive-analysis/#:~:text=Amazon%20Pay%20was%20launched%20in,on%20the%20user's%20Amazon%20profile;FinExtra,> "AmazonPay expands to France Italy and Spain, (2017), Available via: <https://www.finextra.com/pressarticle/68864/amazon-pay-expands-to-france-italy-and-spain>; The PayPers, "Amazon Pay brings out its services in France, Italy and Spain, (2017), Accessible via: <https://thepaypers.com/mobile-payments/amazon-pay-brings-out-its-services-in-france-italy-and-spain--768646>.

<sup>55</sup> DW, "Google Play launches in cash-loving Germany", (2018), Available via: <https://www.dw.com/en/google-pay-hopes-cash-loving-germans-take-to-contactless-payments/a-44399265>.

<sup>56</sup> The PayPers, "Google Pay: Evolution, implementation and future prospects.", (2018), Available via: <https://thepaypers.com/interviews/google-pay-evolution-implementation-and-future-prospects--774730>.

<sup>57</sup> Apple, "Apple Pay to Transform Mobile Payments Starting October 20", (2014), Available via: <https://www.apple.com/newsroom/2014/10/16Apple-Pay-Set-to-Transform-Mobile-Payments-Starting-October-20/?utm>.

<sup>58</sup> Apple, "Apple Pay coming to the UK", (2015), Accessible via: <https://www.apple.com/uk/newsroom/2015/06/08Apple-Pay-Coming-to-the-UK/#:~:text=SAN%20FRANCISCO%20%E2%80%94%20June%208%2C%202015,and%20private%20way%20to%20pay>.

<sup>59</sup> 9to5 Mac, "Apple Pay expands across Europe with official launch in France", (2016), Accessible via: <https://9to5mac.com/2016/07/18/apple-pay-officially-launches-in-france/>.

<sup>60</sup> Mobile World Live, "Apple Pay launches in Belgium", (2018), Accessible via: <https://www.mobileworldlive.com/apple/apple-pay-launches-in-belgium/>.

#### 1.3.4.2. EU as a driver for change

The EU promoted European payment market integration through regulation and strategic initiatives. This integration was based on the premises of creating a secure, seamless and competitive digital/online payment landscape.

In 2007, the EU began payments transformation by introducing the first Payment Services Directive (PSD1) to establish common rules in the European Economic Area (EEA) for all non-cash payments. This directive laid the groundwork for the Single Euro Payments Area (SEPA).<sup>61</sup> The basic requirement for the implementation of SEPA payments was the creation of a uniform and binding legal framework for all Member States where all payments are treated as domestic payments without any distinction. However, as such a legal framework did not exist until 2008, a consistent legal structure had to be put in place for European payment transactions. This process began with the so-called New Legal Framework and was finalized with the entry into force of Directive 2007/64/EC of the European Parliament and of the Council on payment services in the internal market (the so-called Payment Service Directive) and its incorporation into national legislations.<sup>62</sup> PSD1 helped to harmonise SEPA, which is available online in the euro zone.

SEPA is the largest bank-driven payment initiative ever carried out in Europe. Despite the close connection to the banking world, the SEPA project cannot only be seen as a project by banks and regulators; it requires the support and agreement of all market participants. Since the launch of SEPA in 2008, the objective has been to gradually standardize all payment instruments and services, as well as processes in the Euro area, and to eliminate national specificities. This, in turn, allows users to make payment services, for example, from a single account within the SEPA area using SEPA instruments in an online environment. Ultimately, cashless Euro payments, including e-payment, should be as simple, efficient, and secure from a single account within the Euro area as they have been for national payments. The objectives of SEPA include:

- Introduction of new uniform payment instruments, services and procedures
- Strengthening the EU market and its competitiveness
- Legal certainty in European payment transactions
- Establishment of a unified EU payment infrastructure
- Migration of domestic payment markets
- Promotion of market consolidations
- Implementation of uniform standards, norms, and formats (e.g., ISO 20022)
- Strengthening consumer protection

with regulators focusing particularly on removing cross-border market entry barriers, lowering price levels, market consolidation, and increasing efficiency.<sup>63</sup>

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<sup>61</sup> European Commission, "SEPA Overview", (2018) Available via: [https://finance.ec.europa.eu/consumer-finance-and-payments/payment-services/single-euro-payments-area-sepa\\_en](https://finance.ec.europa.eu/consumer-finance-and-payments/payment-services/single-euro-payments-area-sepa_en).

<sup>62</sup> Huch, S., Die Transformation des europäischen Kartengeschäfts, 2013, p. 51.

<sup>63</sup> Huch, S., Die Transformation des europäischen Kartengeschäfts, 2013, p. 54.

In 2018, the second Payment Services Directive (PSD2)<sup>64</sup> came into force with the aim of “*promoting the development of innovative online and mobile payments*” as well as inspiring countries worldwide to adopt similar Application Programming Interface (API) frameworks.<sup>65</sup> PSD2 successfully established the groundwork for Open Banking. It has significantly strengthened payment transaction security through enhanced customer authentication (SCA) and has fostered the growth of electronic payments throughout the EU.<sup>66</sup>

In 2020, the EC adopted the digital finance (DigFin) package<sup>67</sup> and retail payments strategy with four main priorities: removing digital fragmentation in the EU single market, facilitating digital innovation, promoting data-driven finance, and addressing digital transformation challenges. Although the package does not directly address online payments, its components have implications for online payments especially when it comes to implementing higher security standards and open finance.

In parallel, the EU also launched the Digital Euro Project with the goal of providing a digital form of central bank currency to offer more payment choices for consumers and businesses.<sup>68</sup> The intended effect of the Digital Euro is to promote innovation in retail payments while reinforcing the EU’s digital and strategic autonomy.

In June 2023, the European Commission proposed enhancements to PSD2 and laid the foundation for PSD3. This included suggested revisions to EU payment services legislation and the introduction of an open finance framework known as FIDA.<sup>69</sup> PSD3 enhances online payment security through stronger fraud prevention and SCA measures. It aims at improving Open Banking integration, streamlines e-money regulations, and expands payment system access for non-bank providers.

#### **1.3.4.3. Impact of the covid-19 crisis**

The pandemic saw a notable increase in the prominence of digital payments, attributed to two principal factors.

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<sup>64</sup> The Regulatory Technical Standards of PSD2 came into force on 14<sup>th</sup> of September 2019, leading to strong customer authentication (SCA) requirement and access to data provisions, which in turn enhanced the security of digital payments and made it easier to access data. See: Art. 38, of COMMISSION DELEGATED REGULATION (EU) 2018/389 of 27 November 2017 supplementing Directive (EU) 2015/2366 of the European Parliament and of the Council with regard to regulatory technical standards for strong customer authentication and common and secure open standards of communication.

<sup>65</sup> European Commission, “Payment Services: Consumer to benefit from cheaper, safer and more innovative electronic payment”, (2018) Accessible via: [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_18\\_141](https://ec.europa.eu/commission/presscorner/detail/en/ip_18_141).

<sup>66</sup> DG FISMA, “A study on the application and impact of Directive (EU) 2015/2366 on Payment Services (PSD2), (2023), Accessible via: <https://op.europa.eu/en/publication-detail/-/publication/f6f80336-a3aa-11ed-b508-01aa75ed71a1/language-en>.

<sup>67</sup> European Commission, “Digital Finance Package”, (2020), Accessible via: [https://finance.ec.europa.eu/publications/digital-finance-package\\_en](https://finance.ec.europa.eu/publications/digital-finance-package_en).

<sup>68</sup> Proposal for a Regulation of the European Parliament and of the Council on the establishment of the digital euro, COM/2023/369 final, Accessible via: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52023PC0369>.

<sup>69</sup> European Commission Press Release, “Modernising payment services and opening financial services data: new opportunities for consumers and businesses”, (2023), Accessible via [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_23\\_3543](https://ec.europa.eu/commission/presscorner/detail/en/ip_23_3543).

First, during the COVID pandemic consumers were motivated to use contactless payments as traditional cash transactions, card swipes or ATM usage require direct contact and would therefore increase the risk of virus transmission.<sup>70</sup>

Contactless payment methods however, such as mobile wallets, allowed consumers to complete transactions with minimal or no physical contact. Paying contactless was also stimulated by different actors across the EU, ranging from the Euro Retail Payments Board (ERPB)<sup>71</sup>, World Bank<sup>72</sup>, EU trade associations<sup>73</sup> and members state governmental agencies<sup>74</sup>. According to Capgemini's payments' experts the habit of using mobile wallets persisted even as health concerns waned.

Second, the pandemic led to an increase in e-commerce, as people were confined to their homes due to lockdowns and social distancing measures. With physical stores closed or operating at limited capacity, consumers turned to online shopping for essentials and other needs. This shift required the use of digital payment platforms, in the virtual marketplace. These factors drove the adoption of digital payments during the pandemic and accelerated the transition towards a more digital economy.

In terms of revenue of the e-commerce business a slightly different trend is showing. Whereas more people bought goods and services through e-commerce during the pandemic, the actual increase in revenue for the sector showcases an uptick in the year after the pandemic started, namely in 2021. Based on Capgemini's analysis people were waiting to make investments in 2020 due to the unclear future impact of Covid on their income situation, which changed in 2021, where the overall consumer spending was more positive compared to the year out the outbreak.<sup>75</sup> This led to higher revenues in e-commerce while the covid-crisis was still ongoing.

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<sup>70</sup> See e.g., the following article indicating that the transferability of the COVID virus was significantly higher because the virus can survive longer on surfaces that are made from metal (coins), paper fibre (bills) and plastic (ATMs and POS terminals). See: N. Matić, B. Siljković, M. Savi, "Potentials of traditional cash metal coins versus digital contactless payment in the time of coronavirus pandemic.", Mining and Metallurgy Institute BOR, (2020).

<sup>71</sup> ECB, "ERPB Response to the Current COVID-19 Pandemic", (2020), [https://www.ecb.europa.eu/paym/groups/erpb/shared/pdf/13th-ERPB-meeting/Item\\_2\\_-\\_ERPB\\_response\\_to\\_the\\_current\\_Covid19\\_pandemic.pdf](https://www.ecb.europa.eu/paym/groups/erpb/shared/pdf/13th-ERPB-meeting/Item_2_-_ERPB_response_to_the_current_Covid19_pandemic.pdf).

<sup>72</sup> World Bank, "Cash Transfer in Pandemic Times: Evidence, Practices, and Implications from the Largest Scale Up in History", (2022), Accessible via: <https://documents1.worldbank.org/curated/en/099800007112236655/pdf/P17658505ca3820930a254018e229a30bf8.pdf>.

<sup>73</sup> See E.g.: Digital Europe, "Raising Contactless Thresholds in response to COVID-19", (2020), Accessible via: <https://www.digitaleurope.org/resources/raising-contactless-thresholds-in-response-to-covid-19/>.

<sup>74</sup> See E.g.: (1) Febelfin, "Veilig Betalen tijdens de feestdagen, dat doe je zo", (2020) Accessible via: <https://febelfin.be/nl/pers/digitalisering-en-innovatie/veilig-betalen-tijdens-de-feestdagen-dat-doe-je-zo;> (2) Nationale Hoge Raad Personen met een Handicap, "Advies 2020/21", (2020), Accessible via: <https://ph.belgium.be/nl/adviezen/advies-2020-21.html>.

<sup>75</sup> Macrotrends, "European Consumer Spending 1960)2024, (2024), Accessible via: <https://www.macrotrends.net/global-metrics/countries/EUU/european-union/consumer-spending#:~:text=European%20Union%20consumer%20spending%20for,a%204.76%25%20decline%20from%202019.>

According to a survey from McKinsey, COVID-19 increased the digitization of the economy by as much as seven years.<sup>76</sup> According to an ECB survey conducted during the pandemic, consumers changed their “analogue” payment behaviour to a digital alternative for various reasons.<sup>77</sup>

Based on Capgemini's World Payment Reports, the more people become accustomed to non-cash payment instruments, as they are in an e-commerce environment, the more trust is built in these non-cash instruments. Therefore, the decline in the use of cash highlights the increasing trust in non-cash instruments in which the pandemic played an important role.<sup>78</sup>

Since cash is of marginal relevance in e-commerce and is only rarely represented in the payment cycle as cash / card on delivery for e-Payments, the overall development of cash in the EEA does not correspond one by one with the cash usage in e-payments. In recent years, the share of cash on delivery (CoD) payments in Western Europe has significantly reduced, with usage in most countries accounting for less than 5% of online transactions.<sup>79</sup> The countries within the scope of this study that still demonstrate a strong tendency for cash on delivery are Czechia (15.37%), Greece (9.35%) and Latvia (9.30%). It should be noted that, for the purpose of this study, the definition of CoD includes payments made “at the door” using a PoS terminal or other mobile devices. Obtaining data that provides insights into the actual number of consumers paying with coins and notes is difficult, if not impossible.

### 1.3.5. Upcoming trends in the EU online payment landscape

This section provides an overview of the various payment trends identified for this study. The methodology is based on Capgemini's World Payments Report supplemented by input from Capgemini's payment team. It is important to note that this list highlights the most pertinent trends in online payments impacting e-commerce and m-commerce.

A first notable trend is the growing significance of payments done via mobile applications. This trend is driven by the convenience and speed of transactions within the app environment, reducing friction and improving the user experience. More and more apps integrate payment functionality into the latter enabling them to generate customer loyalty. As our research has shown, based on the most used national shopping platform payments via app are very prominent and merchants provide multiple methods at the checkout page (see section 1.2).

A second trend is the continued growth of Digital wallets offering consumers a seamless and secure way to manage their payments. They support a variety of payment methods and can store multiple cards providing a versatile payment solution. Increased smartphone penetration and the push towards contactless payments, accelerated by the COVID-19 pandemic, have significantly boosted the use of digital wallets in the EU.

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<sup>76</sup> McKinsey & Company, “How COVID-19 has pushed companies over the technology tipping point and transformed business forever”, (2020), Accessible via: <https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/our-insights/how-covid-19-has-pushed-companies-over-the-technology-tipping-point-and-transformed-business-forever>.

<sup>77</sup> ECB, “Study on the payment attitudes of consumers in the euro area (SPACE), (2020), Accessible via: <https://www.ecb.europa.eu/pub/pdf/other/ecb.spacereport202012~bb2038bbb6.en.pdf>.

<sup>78</sup> Capgemini, “World Payment Report”, (2021), Available via: [https://prod.ucwe.capgemini.com/wp-content/uploads/2023/08/World-Payments-Report\\_2021\\_Web.pdf](https://prod.ucwe.capgemini.com/wp-content/uploads/2023/08/World-Payments-Report_2021_Web.pdf).

<sup>79</sup> Please note that for this study we also consider card payment on delivery as a cash on delivery payment.

In terms of security, digital wallets use tokenization combined with biometric techniques such as fingerprint or facial recognition. PSD2 plays an important role in the latter as the Directive mandates Strong Customer Authentication (SCA) and therefore promotes tokenization. The multi-level security “checks and balances” that digital wallets foresee could be an important competitive advantage for wallet issuers compared to other payment options. The data gathered for this study indicates that there is, indeed, a significant rise in the adoption of digital wallets across the countries that were scoped for this study (see Figure 3.3 in section 3.3.2).

Third, Network tokenization is taking its place more and more as a payment safety feature as it replaces sensitive card data with unique identification symbols (tokens) that retain essential information without compromising security. This trend increases transaction security, reduces the risk of fraud and simplifies compliance with regulations such as PSD2. In the EU, network tokenisation supports the wider adoption of digital payments and the secure handling of the euro in online transactions.

Currently, both payment firms and corporations are adopting tokenization because of its safety features. Capgemini’s Research Institute for Financial Services analysis concluded that in 2023, the integration of tokenization with decentralized finance (DeFi) systems is leading to innovative use cases, such as deposit tokens and programmable payments.

A fourth trend involves the increasing consumer acceptance rate of BNPL services such as Klarna and Afterpay. This trend can be attributed to the fact that they offer flexible payment options that do not place an immediate financial burden on consumers. This model has proven particularly attractive to younger demographics, contributing to an increase in e-commerce sales. The ease of integration with online platforms and the growing consumer preference for deferred payments have made BNPL a key trend in the online payment landscape. According to Juniper Research the number of consumers using BNPL globally will surpass 900 million by 2027 up from 360 million in 2022.<sup>80</sup> A 2023 report from Statista estimates that the value of BNPL transactions worldwide would increase by 426 billion between 2021 and 2026.<sup>81</sup> For Europe, the trend<sup>82</sup> of increasing BNPL usage has the same outlook.<sup>83</sup>

Players like Apple are also becoming active in the BNPL market. In March 2023, Apple launched “Apple Pay Later” as a service in the US that allows users to split their

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<sup>80</sup> Juniper Research, “Buy Now Pay Later Users to Reach over 900 Million Globally by 2027”, (2022), Accessible via: <https://www.juniperresearch.com/press/bnpl-users-reach-over-900-million-by-2027#:~:text=Globally%20by%202027-,Buy%20Now%20Pay%20Later%20Users%20to%20Reach%20Over%20900%20Million,from%20360%20million%20in%202022.>

<sup>81</sup> Statista, “Global transaction value of buy now, pay later (BNPL) in e-commerce from 2019 to 2021, with forecasts from 2022 to 2028”, July 2024, Accessible via: <https://www.statista.com/statistics/1311122/global-bnpl-market-value-forecast/#:~:text=Global%20buy%20now%2C%20pay%20later,increased%20by%20almost%20400%20percent.>

<sup>82</sup> Macrotrends, “European Consumer Spending 1960-2024, (2024), Accessible via: <https://www.macrotrends.net/global-metrics/countries/EUU/european-union/consumer-spending#:~:text=European%20Union%20consumer%20spending%20for,a%204.76%25%20decline%20from%202019;,.>

<sup>83</sup> Globaldata, “E-Commerce Analytics report”, (2023). Please note the number provided through Global data.

purchases into four payments over six weeks, with no interest and no fees.<sup>84</sup> This service would be available to Apple Pay wallet users. However, only very recently, Apple has decided to discontinue this service and replace it with a service that would allow users to make use of “instalment loans” based on the credit and debit cards the users have linked to their Apple Pay wallet.<sup>85</sup> So far the impact in Europe is limited to Spain as Apple stated in an interview that “*The ability to access instalments from credit and debit cards with Apple Pay will roll out starting in Australia with ANZ, in Spain with CaixaBank, in the UK with HSBC and Monzo; and in the US with Citi, Synchrony, and issuers with Fiserv.*”<sup>86</sup>

Fifth, consumers may have multiple payment applications depending on their specific needs. Research by VISA indicates consumers have on average 2.4 wallets in use. Big Tech wallets, such as Apple Pay, Google Pay, and Samsung Pay, are predominantly favoured for high-value transactions (greater than €100), quick offline payments, and enhanced security. In contrast, domestic bank-led solutions, such as Bizum, MobilePay or Swish, tend to perform better in some countries, especially in the Nordics, by offering localized functionality. These solutions are particularly preferred for peer-to-peer payments and smaller transactions.<sup>87</sup> While consumers potentially have multiple online payment applications at their disposal, the results of the consumer survey (see Chapter 2) revealed that people do not always own multiple online payment applications and, even when they do, they do not necessarily use them all with the same frequency (see Figure 2.29).

A final notable trend is the upcoming Digital Euro (D€), an electronic equivalent form of the euro currency issued by the ECB, that will be useable throughout the EEA.<sup>88</sup> It will serve as a complementary payment service next to existing offerings of cash and wholesale central bank options.<sup>89</sup> Although the D€ is still in its preparation phase<sup>90</sup>, the current debate on its advantages focus on the following areas:

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<sup>84</sup> Apple, “Apple introduces Apple Pay Later”, (2023), Accessible via: <https://www.apple.com/newsroom/2023/03/apple-introduces-apple-pay-later/>.

<sup>85</sup> The Independent, “Apple shuts down Apple Pay Later just months after launch”, June 2024, Accessible via: <https://www.independent.co.uk/tech/apple-pay-later-shut-down-launch-b2564498.html>.

<sup>86</sup> 9to5Mac, “Apple discontinuing Apple Pay Later, ahead of new features launching this fall”, June 2024, Accessible via: <https://9to5mac.com/2024/06/17/apple-pay-later-united-states-ending/>.

<sup>87</sup> VISA, “Decoding the European Mobile Wallet Evolution: Consumer adoption and the future of wallets, November 2023”, Accessible via: <https://www.visa.co.uk/content/dam/VCOM/regional/ve/unitedkingdom/PDF/uk-visa-mobile-wallets-paper-nov-2023-final.pdf>.

<sup>88</sup> ECB, “Consumer demand for central bank digital currency as a means of payment”, (2024), Accessible via: <https://www.ecb.europa.eu/press/research-publications/resbull/2024/html/ecb.rb240918~86165cbefc.en.html>; ECB, “Digital Euro”, Accessible via: [https://www.ecb.europa.eu/euro/digital\\_euro/html/index.en.html](https://www.ecb.europa.eu/euro/digital_euro/html/index.en.html); Capgemini, “Building central bank digital currency: Growth opportunities ahead for central and commercial”, (2023), Accessible via: <https://prod.ucwe.capgemini.com/wp-content/uploads/2023/05/Building-CBDC.pdf>; banks;.

<sup>89</sup> ECB, “Report on a digital euro”, (2020), Accessible via: [https://www.ecb.europa.eu/pub/pdf/other/Report\\_on\\_a\\_digital\\_euro~4d7268b458.en.pdf](https://www.ecb.europa.eu/pub/pdf/other/Report_on_a_digital_euro~4d7268b458.en.pdf).

<sup>90</sup> Based on our payment experts team own understanding corroborated with: European Central Bank, “Progress on the preparation phase of a digital euro - First progress report”, (2023), Accessible via: [https://www.ecb.europa.eu/euro/digital\\_euro/progress/html/ecb.deprp202406.en.html](https://www.ecb.europa.eu/euro/digital_euro/progress/html/ecb.deprp202406.en.html).

1. Digital inclusion: the introduction of the D€ can influence the online payment's ecosystem by facilitating financial and digital inclusion.<sup>91</sup> Currently, euro cash is the most universally accepted payment method in the euro area.<sup>92</sup> With the introduction of the D€ the same can become true for digital currencies. It would provide a secure and public alternative to private digital payment systems, thereby ensuring that all individuals, including those who are currently unbanked or underbanked, have access to a reliable digital form of money which they can use to make online payments.
2. Enhanced payment efficiency: it has been discussed that the D€ has the potential to reduce transaction costs by reducing the number of intermediaries while increasing the speed of the payment. This would be achieved by enabling the payment to be made directly between the payer (consumer) and the payee (online merchant). As this currency is an initiative of the ECB and national banks, the reduced dependency on private payment systems would also contribute to the efficiency, as these systems often apply different fees and have different payment processing times.
3. Enhancing consumer trust: one of the principal advantages of the D€ in comparison to alternative online payment methods would be the support it receives from public institutions, including the ECB and national banking authorities. This institutional endorsement is likely to foster user confidence in adopting the D€ for online transactions. While empirical data on the potential impact of the digital currency is currently limited, it is anticipated that the D€ could establish itself as a viable option among existing payment methods.

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<sup>91</sup> ECB, "A stocktake on the digital euro – Summary Report", (2023), Accessible via: [https://www.ecb.europa.eu/euro/digital\\_euro/timeline/profuse/shared/pdf/ecb.dedocs231018.en.pdf](https://www.ecb.europa.eu/euro/digital_euro/timeline/profuse/shared/pdf/ecb.dedocs231018.en.pdf).

<sup>92</sup> See: [https://www.ecb.europa.eu/press/pubbydate/2022/html/ecb.use\\_of\\_cash\\_companies\\_euro\\_area.06102022~2c3e7fba18.en.html](https://www.ecb.europa.eu/press/pubbydate/2022/html/ecb.use_of_cash_companies_euro_area.06102022~2c3e7fba18.en.html) where Chart 2 indicates that Cash has an 96% acceptance rate, followed by Credit Card (87%) and Contactless card (82%).

## **1.4. Business Models and analysis of associated costs**

This section outlines the costs for different payment methods like cards, wallets, and BNPL solutions, excluding online banking due to its variability. While consumers often face no direct fees, merchants incur transaction fees influenced by payment method, service provider, and regulations.

The business models of payment service providers, including Big Tech wallets, Card Schemes, Traditional Banks, Neo Banks, Fintechs/PISPs, Payment Service Providers, Payment Gateway Providers, and Acquirers/Payment Aggregators are explained in subparagraph 1.4.1. They employ commission-based, freemium, and subscription models to generate revenue. Each stakeholder leverages its unique position to offer tailored services and pricing models to merchants.

### **1.4.1. Costs for consumers and merchants per payment method**

Understanding the costs associated with various payment methods is essential for both consumers and merchants so they can make informed decisions about payment processing options that best align with their financial strategies and customer preferences. Table 1.24 provides a comprehensive overview of the costs incurred by consumers and merchants for various payment methods, such as cards, wallets and BNPL solutions. Online Banking as a banking service has not been included, since the costs for online banking vary too strong per company, customer and country to give any valid results.

For consumers, many payment methods are offered at no additional cost, as they are typically included in account packages or merchants' prices. This is particularly true for credit cards, debit cards, credit transfers, direct debits, and various wallet options. However, while consumers may not face direct fees from e.g. issuers or banks, it is important to consider the potential costs that may individually arise from merchant to consumers per transaction, which can vary significantly depending on the payment method used.

Merchants, on the other hand, often bear transaction fees that can range from a fixed amount to a percentage of the transaction value. These fees can be influenced by factors such as the type of payment method, the service provider, and regulatory frameworks like the EU Interchange Fee Regulation, which sets caps on certain transaction fees for credit and debit cards.

Table 1.24: Direct costs for consumers and merchants by payment method

Direct cost for Consumers		Comment	Cost for Merchants	Comment
<b>Credit Card</b>	0 Euro	Part of the account package	0,5% - 3,1% per transaction	Including EU Interchange fee regulation of min. 0.3% per transaction for Visa and MasterCard plus individual fix cost of 0,05 Euro to 0,3 Euro per transaction.
<b>Debit Cards</b>	0 Euro	Part of the account package	0,2% - 2,5% per transaction	Including EU Interchange fee regulation of min. 0.2% per transaction and potential fix cost per transaction of 0,05 Euro to 0,25 Euro.
<b>Credit Transfer</b>	0 Euro	Part of the account package	0 Euro	-
<b>Direct Debit</b>	0 Euro	Part of the account package	0,1 - 0,5 Euro per transaction	Some banks / acquiring banks charge an additional monthly fee of 5 - 50 Euro
<b>Wallets (Pass-through)</b>	0 Euro	Free of charge for all wallets in the EEA	0 Euro	No wallet fees but depending on account charge method card or bank fees
<b>Wallets (Staged)</b>	0 Euro	Paypal offers free of charge for customer (sender) but some merchants charge a fee from customer between 0 and 1 Euro.	0,09% - 4,99% per transaction	E.g. Paypal, international transaction will be charged separately additional 1,99% or QR Codes transaction up to 1% and often a fix price fee e.g. 0,35 Euro per transaction.
<b>Pay per invoice</b>	0 Euro	Free of charge for all invoices in the EEA	0 Euro	Only internal administrative costs or costs of debt collection.
<b>Payment on delivery</b>	0 Euro	Payment on delivery is free of charge for customers, but some merchants charge a fee from customer up to 10 Euro (transfer of cost)	4 - 10 Euro per transaction	Strongly relies on country, merchant and logistic supplier (e.g. DHL 4,90 Euro, Hermes 4 - 8 Euro, DPD 6 - 8 Euro.

<b>BNPL Solutions</b>	0 Euro	Free of charge for all users, e.g. Klarna, in the EEA. But costs can be incurred if an instalment is missed. <sup>93</sup>	0,3 - 0,50 Euro per transaction or 2% - 6% per transaction	Depending on service provider (e.g. Klarna 2,49% - 5,99% transaction fee and 0,3 Euro per Transaction, Afterpay (Clearpay) 4 - 6% per transaction, Affirm 5 - 6% per transaction, Ratepay 3 - 5% per transaction).
<b>Prepaid</b>	0 Euro	Free of charge for all users, sometimes discounts, in the EEA.	1 - 5% per transaction and fix price of 0,1 - 0,5 Euro per transaction	Strongly depends on Prepaid-payment method and payment provider, e.g. Paysafecard 2 - 5% per transaction, Cash-Ticket or Neosurf 3 - 5% per transaction, Visa/ Mastercard 1,5 - 3% per transaction, voucher cards (Amazon etc.) up to 10% per transaction.

Source: Capgemini Research Institute<sup>94</sup>

<sup>93</sup> BEUC, Factsheet: Buy Now Pay Later, (2022), Accessible via: [https://www.beuc.eu/sites/default/files/publications/beuc-x-2022-017\\_buy\\_now\\_pay\\_later\\_products.pdf](https://www.beuc.eu/sites/default/files/publications/beuc-x-2022-017_buy_now_pay_later_products.pdf).

<sup>94</sup> R. Alt & S. Alt, R. & Huch, S., Fintech Dictionary - Terminology for the Digitalized Financial World, Springer, Wiesbaden, 2022, p. 132; Oxford English Dictionary, available via: Oxford English Dictionary; S. Huch, "Die Transformation des Europäischen Kartengeschäfts: Auswirkungen der Liberalisierung und Harmonisierung des EU-Zahlungsverkehrs", (2023), Capgemini Research 2024, Capgemini World Payment Report series 2023-2025; [www.visa.com](http://www.visa.com); [www.mastercard.com](http://www.mastercard.com); [www.Paypal.com](http://www.Paypal.com); <https://www.apple.com/de/apple-pay/>; wise.com; firstdata.com; <https://www.fiserv.com/en>; Study of Deutsche Bundesbank: Kosten von Bargeld und Kartenzahlungen aus Verbrauchersicht.

The costs presented in Table 1.24 represent direct costs for the use of a payment instrument and are to be understood as averages and ranges across countries and providers, such as national and international payment service providers, acquirers, etc., as well as across the respective industry in which the transaction is carried out. Accordingly, the costs for individual payment instruments, such as credit cards, vary depending on the risk of default in each industry.

Although the costs must be related to the transaction amount, there are significant differences between countries and payment methods. This has not been represented separately and is included in the specified cost range. The costs in the table are to be understood as direct costs for merchants and customers/consumers. For merchants in e-commerce, these range from 0% for Pay per Invoice to 6% for Buy Now Pay Later (BNPL), from 0.2% to 2.5% for debit cards, and from 0.3% to 3.1% for credit cards. The differences can be explained, among other things, by the fixed cost element, which has a greater impact when considering "costs as a percentage of transaction value" the smaller the transaction values are. For example, the payment service provider Stripe charges 1.5% + €0.25 per transaction with EU credit cards<sup>95</sup>.

Additionally, the costs consist of the costs for the payment method and the additional acquiring costs, which include, in particular, the Merchant Service Charge. Furthermore, these costs vary by country and company. It can be noted that the larger the company and thus the higher the number of transactions, the lower the price per transaction.

Pass-through wallets offer their services to merchants free of charge. However, merchants must reimburse the costs for the payment methods provided by the customer. These costs again depend on the type of payment method and the respective acquirer or payment service provider.

For invoice payments, there are also no direct costs for merchants. In this case, payment is often made via credit transfer by the customer. The payment receipt in the respective settlement account of the merchant at the merchant's bank or an acquirer is free of charge.

In addition to direct costs, however, indirect costs for merchants must also be mentioned. For example, each merchant incurs account maintenance costs. Without accounts, payments by invoice would not be possible. Therefore, account maintenance costs must be considered in the broadest sense. However, these costs cannot be determined. Especially in the B2B sector, there are rarely models where, for example, banks offer merchants free account maintenance. Even if that is the case, merchants incur costs due to so-called cross-subsidizations, for example, in credit transactions or cash management. Therefore, it can be concluded that none of the above-mentioned payment methods are free of charge for merchants when considering the indirect costs.

From the consumers' perspective, the situation is similar. The costs for payment instruments are free per transaction. However, there are also indirect costs for consumers. Consumers must pay bank fees for their checking/settlement accounts, which are not considered in the transaction analysis. These fees, like those for

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<sup>95</sup> R. Alt & S. Alt, R. & Huch, S., *Fintech Dictionary - Terminology for the Digitalized Financial World*, Springer, Wiesbaden, 2022, p. 132; Oxford English Dictionary, available via: Oxford English Dictionary; S. Huch, "Die Transformation des Europäischen Kartengeschäfts: Auswirkungen der Liberalisierung und Harmonisierung des EU-Zahlungsverkehrs", (2023), Capgemini Research 2024, Capgemini World Payment Report series 2023-2025; [www.visa.com](https://www.visa.com); [www.mastercard.com](https://www.mastercard.com); [www.paypal.com](https://www.paypal.com); <https://www.apple.com/de/apple-pay/>; [wise.com](https://www.wise.com); [firstdata.com](https://firstdata.com); <https://www.fiserv.com/en>; Study of Deutsche Bundesbank: Kosten von Bargeld und Kartenzahlungen aus Verbrauchersicht.

merchants, vary by country and bank and are not included in the consideration of direct costs. The same applies to debit cards. These are often part of a package deal and are priced indirectly rather than directly. In contrast, credit cards can incur both direct costs, such as annual fees, and indirect costs, with free credit cards, through the account. When considering direct costs, it should be noted that these often include additional services, such as insurance or loyalty programs. However, it can be stated that consumers do not incur costs in the form of transaction fees like merchants do.

Nevertheless, it can be summarized that the direct costs for consumers are €0, while the indirect costs are significantly higher. Depending on the cost model of a bank for checking/settlement accounts or an annual fee for payment cards, wallets, or BNPL, the costs per transaction for consumers are well above €0.

#### **1.4.2. Business models of payment service providers**

The table below details the different business models used by different stakeholders in the payment ecosystem, including Big Tech Wallets, Card Schemes, Traditional Banks, Neo Banks, Fintechs/PISPs, Payment Service Providers, Payment Gateway Providers, and Acquirers/Payment Aggregators. These stakeholders use commission-based, freemium and subscription models to generate revenue from e.g. merchants, issuer or acquirer directly or indirectly.

- **Commission-based model:** This model is a fundamental source of revenue for stakeholders. Wallets such as Google Pay and Apple Pay are free of charge to merchants and customers, but the merchant must pay a fixed percentage transaction fees to the Payment Service Provider for routing and switching the transaction as well as for provision and conclusion of a credit card acceptance contract, in case the wallet accepted credit cards (only). Paypal is not free of charge to merchants and generates revenue through fixed percentage transaction fees as well as fees on international transactions or secure payments. Similarly, four party Card Schemes operate on the basis of interchange fees<sup>96</sup>, merchant service charges are charged by acquirers on merchants<sup>97</sup> and other specific fees depending on whether they operate nationally (e.g. Girocard<sup>98</sup>) or internationally (e.g. Visa, MasterCard). Traditional banks and Fintechs/PISPs also rely on transaction fees for services such as online payment initiation or card payments.
- **Freemium model:** The freemium model is prevalent, for example, some wallets like Paypal, banks and PSPs that offer basic services to merchants for free but charge for premium features. For example, Paypal also offers a basic account for businesses for free (individual offerings like to BMW), but charges for business accounts with enhanced customer support and offers better foreign exchange

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<sup>96</sup> Interchange Fees (IF) are for card payments in the four-corner model, IF payments are made from the acquirer to the issuer. These form a part of the Merchant Service Charge (MSC) that is billed by the acquirer to the merchant. In the case of EMV, the IF for debit and charge or credit cards in Germany are often in the range of 0.2% for debit to 0.3% for credit of the transaction value.

<sup>97</sup> Merchant service charges or Disagio is a service fee charged by the acquirer to the merchant, such as credit card transactions, which the merchant can include in the sales price. Frequently, the fee is calculated as a percentage of the transaction value plus a transaction-fixed fee (e.g. for authorization). The MSC reflects the acquirer's transaction processing costs and together with the IF gives the total cost of card transaction charged to the customer.

<sup>98</sup> Debit card fee (e.g. 0.2% per transaction) as regulated in the REGULATION (EU) 2015/751 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 29 April 2015 on interchange fees for card-based payment transactions.

rates to merchants. PSPs and banks may offer basic fraud prevention features, but charge for advanced credit checks, cross-border currency exchange or detailed data analysis. Fintechs such as Klarna offer basic onboarding packages for free to merchants and charge for additional support or API access, e.g. ramp-up fees.

- **Subscription model:** This model involves regular payments for ongoing access to products or services. Big Tech wallets, Neo Banks and Fintechs offer basic services for free to consumers and merchants, with premium services available for a subscription fee. These premium services may include faster transaction processing, additional fraud services and financial management tools. Payment gateway providers and PSPs, such as Square, offer subscription plans that provide access to advanced analytics and marketing tools.

Looking at the business models generally adopted by each of the major stakeholders in the online payments market, some patterns can be identified:

- **Big Techs (wallets):** They often offer basic accounts for free (at least to consumers and some also to merchants, e.g. Apple) but also charge transaction fees to merchants for value-added services such as individual product or sector reporting. They leverage their extensive user base to scale their revenues as the volume of transactions increases.
- **Card schemes:** They charge acquirers, merchants with bilateral agreements and also issuer for services such as network service, authorization, currency conversion, fraud prevention, data security and also for detailed customer analysis beyond basic transaction processing, e.g. transactions per card and customer.
- **Traditional banks:** Banks like Deutsche Bank or Credit Agricole etc. charge for services such as merchant acquiring, instant payments, direct debit or bank account services in the context of e-payment. Merchants have to pay for payment services like direct debit or merchant acquiring solutions like authorization or transaction processing by the bank.
- **Neo Banks:** They offer mostly technology-driven solutions and user experience, for example global coverage via partners or online solutions only. Since Neo-Banks focus more on digital banking solutions than traditional banks, they also charge for online services to merchant and/ or customer. But in terms of making money in e-payments, there are some similarities between neo-banks and traditional banks, such as charging fees to merchants or customers for certain services like international transactions, FX conversion or instant transactions, and generating revenue from credit business and partnerships for cross-selling solutions, like insurances. However, due to their digital nature and more agile business models, neo-banks can potentially be more efficient and therefore offer more competitive propositions which leads to lower fees for customers.
- **PISPs:** Focused on account-to-account, PISPs charge transaction fees to merchants and emphasize ease of integration and advanced features such as enhanced fraud management, as prevention, detection or security standards.
- **Payment gateway providers:** They earn through gateway and transaction fees and offer subscription models for different levels of service to Payment Service Provider, Acquirer or direct to merchants, whoever is the contracted party, often focusing on the technology aspect of payment processing.
- **Acquirers/payment aggregators:** While they mainly earn from credit services such as POS financing or secure pay for credit card transactions, transaction fees like merchant service charge or processing fees, they are diversifying by offering subscription models that provide merchants with benefits such as lower transaction fees and premium support.

In summary, these players have adopted different revenue models, have substantial capabilities to offer their business model in e-payments individually to merchants, while Traditional Banks and Neo Banks capitalise on their customer relationships, by offering on the one hand highly standardized products and solutions but also enabling merchants in e-payment to design individualized pricing models and services at the checkout. PISPs and Payment Gateway Providers focus on technology and flexibility to attract merchants, and Wallets leverage their position to charge transaction-based fees and offer individual solutions like premium or subscriptions.

**Table 1.25: Business models of stakeholders to merchants – Definitions**

<b>Business Model of stakeholder to merchants</b>	<b>Commission-based</b>	<b>Freemium</b>	<b>Subscriptions</b>
Definition	In a commission-based merchant marketplace revenue model, providers earn a share and/or a fixed commission from each transaction processed on the marketplace of the merchant. PSPs can charge a commission at a fixed percentage or fixed flat fees. As a marketplace of a merchant scales up and the transactions it processes increase, PSPs can earn more commissions.	Freemium is a business model in which a PSP offers basic or limited features/services to merchants at no cost and then charges a premium for supplemental or advanced features/services.	The subscription business model is a business model in which a customer must pay a recurring price at regular intervals for access to a product or service (Recurring Flat Rate, Tiered Pricing, Pay-as-you-go).

*Source: Project Team*

Table 1.26: Business models of stakeholders to merchants – Types of fees

S/N	Business Model of Stakeholder to Merchants	Most relevant type of Fees	Description	Commission-based	Freemium	Subscriptions
1	Digital Wallets	Merchant Service Charge (Trx. Fee)		Paypal, Amazon Pay, Samsung Pay, WeChat Pay, Alipay, Apple and Google Pay (only indirectly to PSP) X - Transaction fees, esp. international or C2B (Paypal) - Merchant Service Charge (value of transaction based)	Paypal, Google Pay, Apple Pay X - free are Basic Services and Basic Accounts, e.g. Standard Business Account	X Paypal, Alipay, WeChat Pay, Amazon Pay, Apple and Google Pay (only indirectly to PSP)
		Fraud & Security Fees		X		X - Basic Services: send and receive money (e.g. family and friends both also for merchants) for private customer of merchants or for merchants to be charged for Service Level Agreements e.g. check-out
		Account Fees/ Membership	License fee		X - Premium Accounts, e.g. Business Account	

		Value added Services	Individual reports and additional fraud services etc.	X	X	- Value added Services, e.g. Extended customer support, better FX-rates, higher transaction limits - Account Fees only for premium accounts	X	Premium Services, faster processing of transaction, additional fraud services, finance-management tools
2	Card Schemes (only indirectly charged to merchants via Acquirer or PSP as e.g. part of MSC)	Membership	International/ National Card Scheme license fees ("one shot")		National Card Schemes: - Girocard/ Bancomat/ Cartes Bancaires etc.: International Card Schemes: - Visa/ MasterCard: - Amex:	X	National Card Schemes: - Girocard/ Bancomat/ Cartes Bancaires etc.:  X	National Card Schemes: - Girocard/ Bancomat/ Cartes Bancaires etc.: N/A
		Global volumes fees	Branding fees based on the total amount spent per ICS card	X	International Card Schemes: - Visa/ MasterCard			
		Specific volume fees	Fees based on the number of x-border transactions processed by card scheme infrastructure	X	International Card Schemes: - Visa/ MasterCard	X		

Network Service Charge	Availability to get access to international card and payment network	X	<p>National Card Schemes:</p> <p>- Girocard/ Bancomat/ Cartes Bancaires</p> <p>International Card Schemes:</p> <p>- Visa/ MasterCard</p>	X	
Assessment Fees	Fees go to the international and national card brands, such. Assessments are flat amounts paid to the card schemes.	X	<p>International Card Schemes:</p> <p>- Visa/ MasterCard</p>	X	
Currency conversion	Fees related to currency conversion for international TRX	X	<p>International Card Schemes:</p> <p>- Visa/ MasterCard</p>	X	<p>International Card Schemes:</p> <p>- Visa/ MasterCard: Value added Services, e.g. Data analysis, fraud prevention</p> <p>- Amex: for Card issuing, e.g. annual card fees or authorization fee</p>
Fraud Prevention & Data Security		X	<p>National Card Schemes:</p> <p>- Girocard/ Bancomat/ Cartes Bancaires</p> <p>International Card Schemes:</p>	X	

		- Visa/ MasterCard					
				National Card Schemes:			
				- Girocard/ Bancomat/ Cartes Bancaires			
				International Card Schemes:			
				- Visa/ MasterCard			
		Authorization	Fees related to the use of card schemes infrastructure	X	X		
3	Traditional Banks	Interchange Fees going to issuing banks charged to acquiring banks		X	X		
		Business Account Fees	License fee for business bank account			J.P. Morgan Chase, Deutsche Bank	X
		Processing Fees	Process Transactions via Third Party processor	X		- Basic Services, e.g. Online Banking (SCT/ SDD)	
		Currency conversion	Fees related to currency conversion for international tax	X		- Premium Services, e.g. Instant Payment, online payment insurances	
		(Payment Check-Out)-leasing & Service fee	Check-Out Page at Merchant website	X			
		Value-added Services	Additional Fraud or Data Security Fees, Cash Management	X			

4	Neo Banks	Clearing & Settlement Fees	X				
		Reporting	Individual reporting	X			
		Interchange Fees going to issuing banks charged to acquiring banks	X		X		
		Business Account Fees	License fee for business bank account				
		Processing Fees	Process Transactions via Third Party processor	X	N26, Revolut, Monzo	X	N26, Revolut, Monzo
		Currency conversion	Fees related to currency conversion for international tax	X	- Offer International transaction, e.g. Outside SEPA or FX Services as commission based model	- Basic Services, e.g. Online Banking (SCT/ SDD)	X N26, Revolut, Monzo
		(Payment Check-Out)-leasing & Service fee	Check-Out Page at Merchant website	X		- Premium Services, e.g. Instant Payment, online payment insurances	- Premium Accounts, e.g. N26 Metal, Revolut Premium
		Value-added Services	Additional Fraud or Data Security Fees, Cash Management	X		X	
		Clearing & Settlement Fees		X			
		Reporting	Individual reporting?	X			
5	PISP	Transaction Fee	License fee for account	X		X	X

		Value-added Services	Additional Fraud or Data Security Fees, Cash Management	X		X	Klarna, Trustly, TrueLayer, Tink, GoCardless, Adyen, Paid, Yolt	
		One-time set-up cost/ cost for implementation	Set-up interface, align on data structure, test environment etc.	X	Klarna, Trustly, TrueLayer, Tink, GoCardless, Adyen, Paid, Yolt	—	- Basic Services, e.g. Free onboarding packages and services	Klarna, Trustly, TrueLayer, Tink, GoCardless, Adyen, Paid, Yolt
					- Transaction Fees: e.g. online payment initiation (Trustly, Adyen)	—	- Premium Services, e.g. Additional support, enlarged fraud or security standards, higher API-Access Limits	- Provide access to APIs and services providers (TrueLayer, Tink)
		Processing Fees	Process Transactions via third parties like Banks	X		X		- Tiered Pricing for different API-levels or features
6	Payment Service Provider	Account Fees/ Membership		X				
		Transaction Fees		X	Paypal, Stripe, Adyen	X	- In this model, the PSP offers basic services for free and charges fees for advanced or additional features.	- Some PSPs also offer subscription models where merchants pay a monthly or annual fee to gain access to certain services or a higher level of service.
		Processing Fees	Process Transactions via Third Party processor	X	- PSPs mainly earn through transaction fees, which are calculated as a percentage of the transaction value.	X		X
		Currency conversion	Fees related to currency conversion for international tax	X				

		(Payment Check-Out)- leasing & Service fee	Check-Out Page at Merchant website	X	- These fees can also include fixed fees per transaction.	X	- This may include lower transaction fees or access to special services.	- These subscriptions may include additional features, lower transaction fees or premium support.
		Value-added Services	Additional Fraud or Data Security Fees, Cash Management	X		X	- Examples: Some PSPs offer basic features for free but charge for premium services or special integrations.	- Examples: Square offers subscription plans for additional services such as advanced analytics or marketing tools.
		One-time set- up cost/ cost for implementation	Set-up interface, align on data structure, test environment etc.	X				
		Reporting	Individual reporting?	X				
7	Payment Gateway Provider (provider of web interfaces and APIs)	Gateway Fee		X	Stripe, Paypal. Authorize.Net, Braintree, Square, Adyen, Verfone, Wordpay, CyberSource, BlueSnap, Mollie		- Some payment gateway providers offer a freemium model where basic gateway services are free, while advanced features or premium services are chargeable.	- Many payment gateways also offer subscription models where merchants pay a monthly or annual fee to gain access to the gateway's services.  - These subscriptions can include different service levels, additional features or lower transaction fees.
		Transaction Fees		X		X		
		One-time set- up cost/ cost for implementation	Set-up interface, align on data structure, test environment etc.	X	- These fees are often the main component of their income.  - As with PSPs, many payment gateway providers charge transaction fees, either as a percentage of the transaction value or as a fixed fee per transaction.			
		Authorization/ Rooting Fees		X		X		

						<p>- This can include, for example, providing basic payment gateways for free, but charging for advanced features such as fraud prevention, advanced analytics tools or premium support.</p> <p>- Examples: Some smaller or specialized providers may use freemium models to gain market share.</p>	<p>- Examples: Authorize.net has a subscription model with a monthly fee and additional transaction fees. Others are Stripe, Adyen, Braintree, Worldpay, Verifone, First Data, Zuora, Chargebee</p>
8	Acquirer/ Payment Aggregator	Acquiring network fee	Rooting and Switching	X		X	X
		Merchant Service Charge/ Transaction fees	incl. Interchange, Scheme and Acquirer fee	X	- Acquirers such as Worldpay, First Data, and Chase Paymentech operate primarily on this basis.	X	
		Interchange Fees		X		X	

(Payment Check-Out)- leasing & Service fee	Check-Out Page at Merchant website	X	<p>- Acquirers mainly earn through transaction fees, which are calculated as a percentage of the transaction value. In general part of MSC, which are passed on to the card-issuing banks, and other fees for processing transactions.</p>	X	<p>- This model is less common among acquirers. However, some providers may offer basic services for free or at very low cost and charge for advanced features or premium services.</p>	<p>- These subscriptions can include benefits such as lower transaction fees, special reporting or premium support.</p> <p>- Examples: Some acquirers may have subscription models for additional services or special merchant programs.</p>
Value-added Services	Additional Fraud or Data Security Fees	X		X		
Clearing & Settlement Fees		X				
One-time set- up cost/ cost for implementation	Set-up interface, align on data structure, test environment etc.	X				
Currency conversion	FX-Rates and Services	X				
Reporting		X			<p>- Such freemium models are more likely to be found with PSPs or payment gateways that work closely with acquirers.</p> <p>- In addition to the percentage fees, there may also be fixed fees per transaction.</p>	

Source: Project Team

**Table 1.27: Business models of Payment Service Providers (PSPs) and stakeholders – Use cases**

Business Model of Stakeholder to Merchants	Use Cases - Merchants	Use Cases - OEM <sup>99</sup>
1 Digital Wallets	<p>A direct contractual relationship with the wallet providers e.g. Amazon - Amazon Pay. eBay - Paypal Apple - Apple Pay</p> <p>All of the merchants mentioned here have a direct/ bilateral connection to the wallets, not using PSP as intermediate, which are predominantly developed in-house; the business model is not transparent, but all three mentioned preferring commission-based, in particular due to the high number of transactions</p>	<p>BMW has a direct connection to Paypal as part of its Mobility Services. This does not apply to all Now services (these are BMW mobility Services call "Now services), e.g. not for Connected Drive or ChargeNow. In the case of a direct connection, the commission-based model predominates some services e.g. use of ParkNow to purchase parking tickets. For example, Paypal generally charges a fee of around 2.9% + USD 0.30 per transaction. This model is particularly suitable for Now services due to the rather low business volumes. In this case, a subscription is not worthwhile for the OEMM and Freemium is not worthwhile for Paypal. BMW agreed with Paypal a gradual/ step-by-step pricing model</p>
2 Card Schemes	<p>No direct contractual agreement only via PSP and Banks</p> <p>Exceptions include direct contracting included with Amazon, Microsoft, Apple (Services):</p> <ol style="list-style-type: none"> <li>1. <b>Amazon:</b> has direct agreements with credit card schemes to reduce payment processing costs and optimize payment infrastructure;</li> <li>2. <b>Microsoft (Services):</b> the high business volumes allow Microsoft to negotiate lower transaction fees;</li> <li>3. <b>Apple (Services):</b> direct agreements with credit card schemes, especially given the high business volumes and</li> </ol>	<p>only via PSP and Banks</p> <p>Examples of OEMs with direct contractual relationships</p> <ol style="list-style-type: none"> <li>1. <b>Samsung:</b> to make payment processes globally efficient, since Samsung does not need to contact in each region PSP or need to pay local PSP for cross boarder acquiring;</li> <li>2. <b>Microsoft (OEM products):</b> the high business volumes allow Microsoft to negotiate lower transaction fees;</li> <li>3. <b>Tesla:</b> Tesla has direct contracts with credit card schemes to reduce transaction fees and optimize payment</li> </ol>

<sup>99</sup> The separation between Original Equipment Manufacturers (OEMs) and Merchants is relevant because an OEM engages in direct sales to end customers, it could be considered a merchant to some extent if it distributes products from other manufacturers or suppliers. However, if the OEM company exclusively sells its own manufactured products directly to end customers, it may not necessarily be considered a merchant, as it would be acting as a manufacturer and direct seller in this case. The term "merchant" typically refers to companies that purchase and resell products from other manufacturers or suppliers.

	<p>global reach required to optimize payment processes, which PSP are lacking.</p> <p>Commission-based for Amazon, Walmart, Apple</p> <ul style="list-style-type: none"> <li>- Due to the high business volumes, they benefit from lower transaction fees.</li> <li>- Cost savings due to "scale" can reduce the cost of card transactions due to higher volume processed by one provider (like ICS) and cost savings by cutting out the middleman (PSP)</li> <li>- Tailor-made solutions per merchant: All three merchants can negotiate specific requirements and customizations directly with the card schemes.</li> </ul> <p>Subscriptions</p> <ul style="list-style-type: none"> <li>- Technical implementation: The direct integration of card schemes requires regular maintenance and follow-up IT-support</li> </ul>	<p>processes, e.g. to cover global card acceptance without having regional/ local PSP.</p> <p>4. <b>Apple (OEM products):</b> direct agreements with credit card schemes, especially given the high business volumes and global reach required to optimize payment processes, which PSP are lacking, e.g. in certain markets like Russia or China.</p> <p>Commission-based</p> <ul style="list-style-type: none"> <li>- Cost reduction: By eliminating the middleman/ intermediary (PSP), OEMs can reduce transaction fees., eliminate PSP ramp-up fees and PSP service charge.</li> <li>- Customized solutions: All three OEMs require customized payment processing solutions, for example Tesla with high values and Samsung with high business volumes that are better suited to the company's specific needs.</li> <li>- Scalability: All OEMs already have the necessary infrastructure and security measures in place for direct payment processing.</li> <li>- Risk management and reporting: Tesla in particular requires special reporting on customer groups and regions in order to adapt the payment profile, accordingly, e.g. purchase of a car by credit card.</li> </ul>
3	<p>Traditional Banks</p> <p>Aldi, as a large international retailer, has a direct and unique payment processing relationship in Germany with WestLB now Helaba. Special conditions have been negotiated for both online and over-the-counter retail. Here are some details of how Aldi handles payment processing:</p> <p>Commission-based: Lower, individual fees for Girocard transactions were agreed for the processing of POS business in Germany. These are between 0.1% and 0.155% per transaction, instead of 0.2% as specified by Girocard? for debit cards.</p> <p>Subscription: for the implementation and maintenance of a direct payment processing infrastructure by the bank</p>	<p>1. Online payments for vehicles and accessories:</p> <ul style="list-style-type: none"> <li>- For online payments for vehicles, accessories or services (e.g. service bookings, spare parts), all three car manufacturers use their own financial services branches (e.g. BMW Financial Services, Volkswagen Financial Services, Mercedes-Benz Financial Services), which maintain direct relationships with the house bank or traditional banks and financial institutions in order to accept various payment methods such as credit cards, Paypal or digital wallets.</li> <li>- Commission-based model is the OEMs' preferred business model</li> </ul> <p>2. Connected car services:</p> <ul style="list-style-type: none"> <li>- With the introduction of connected car services (e.g. in-car payments for refuelling, parking or tolls), these companies are</li> </ul>

		2. to ensure regulatory compliance by the bank: Aldi must ensure that all transactions comply with local and international regulations, which is particularly challenging in various markets and has been handed over to the bank	working with specialized banks to offer seamless payment experiences. In particular, direct integration with banks is preferred, as in some cases direct integrations, e.g. in the context of cash management, with banks may be necessary to enable specific services. However, the banks also support integration into the sub- and master ledger programs, e.g. from SAP.
4	Neo Banks	Revolut offers e.g. Shopify a commission-based model for its payment processing services. Revolut generates revenue from transaction fees, taking a percentage of each transaction processed through its system. This commission-based approach allows Shopify to pay only for the actual volume of transactions rather than a fixed fee, making it a flexible and scalable solution for varying levels of sales activity.	N/A
5	PISP	Amazon, Zalando and IKEA have directly bilateral integrated PISPs, e.g. TrueLayer, Klarna, Tink to enable direct bank transfers for customers in certain European markets, like Germany, Sweden, Austria, the Netherlands, Norway, Denmark, Finland. This provides a seamless and cost-effective payment option directly from customer bank accounts, to offer A2A Payments.	N/A
6	Payment Service Provider	<p>Freemium: Rewe</p> <ol style="list-style-type: none"> <li>1. basic payment processing at Rewe, in particular Rewe to Go: i.e. processing of standard payment methods (e.g. credit cards, Paypal) up to a certain business volume.</li> <li>2. basic fraud check (fraud detection).</li> <li>3. basic reports on transactions and processing per day, month and year</li> <li>4. integration tool: API access and simple integration modules for the Zalando e-commerce platform.</li> </ol> <p>Commission Based Services: Rewe</p> <ol style="list-style-type: none"> <li>1. advanced payment processing: <ul style="list-style-type: none"> <li>- Support for a greater number of payment methods, more than the standard methods, such as Apple Pay</li> </ul> </li> </ol>	<ol style="list-style-type: none"> <li>1. free minimum for basic services (free of charge): <ul style="list-style-type: none"> <li>- Basic payment processing: allows BMW to accept basic online payments, including credit and debit cards.</li> <li>- Standard payment methods: Acceptance of common payment methods such as Visa, MasterCard, and some regional, such as "on account" payment methods.</li> </ul> </li> <li>2. premium services (commission-based) <ul style="list-style-type: none"> <li>- Enhanced payment methods: Additional leads per acceptance of additional payment methods such as Paypal, Apple Pay, Google Pay etc.</li> <li>- Recurrent billing and subscription services: Features to manage recurring payments and subscriptions.</li> </ul> </li> </ol>

	<ol style="list-style-type: none"> <li>enhanced security features to reduce chargebacks, at Toom Baumarkt.</li> <li>detailed transaction analysis and customizable reports per online store and brand</li> <li>payment guarantee: guarantee of receipt of payment even in the event of chargebacks (chargeback protection).</li> <li>invoicing and subscription management: automated management of subscription services and recurring invoices.</li> </ol>	<ul style="list-style-type: none"> <li>- Advanced fraud prevention: Additional security functions and fraud detection measures, e.g. when transactions are made from abroad with a foreign vehicle.</li> <li>- Extended reports and analyses: More detailed and customizable reports per service/product or per mobility solution (ChargeNow etc.)</li> <li>- Foreign currencies: Support or better exchange rates for international, non-euro, transactions.</li> </ul>
7	<p>Payment Gateway Provider (provider of web interfaces and APIs)</p> <ol style="list-style-type: none"> <li>Freemium for Gateway, if Merchant (e.g. Multimedia, Sky) accepts preselected payment provider/ partners the payment gateway provider, like FirstData, OmniPay, Elavon or direct to card schemes (Visa, MC and Amex)</li> <li>Commission-based or Subscription if Merchants only contrasting with the gateway and connects self-selected payment service provider, which are not preferred partner of the gateway</li> <li>Online streaming chargeback rate on top of fees for freemium model (to reduce future Schemes fees related to chargeback)</li> </ol>	<p>Freemium for Gateway and partners, but extra charge for advanced fraud services (e.g. Credit card chargeback). Most gateways like Stripe have their own preferred partner. If the merchants choose the preferred gateway partner, PSP services are part of the freemium model, e.g. ramp-up or routing and switching of transactions.</p>
8	<p>Acquirer/ Payment Aggregator</p> <p>Notable examples are the retailers IKEA and Zalando. Both process online payments via acquirers and pay a fee per transaction. Both online retailers have agreed a percentage of the transaction value and a fixed fee per transaction. The reasons given for this were:</p> <ol style="list-style-type: none"> <li><b>Predictability of costs:</b> the fees are directly linked to the business volume, which makes cost planning easier and also means that costs are only incurred when sales (bookings) are generated.</li> <li><b>Scalability:</b> both companies are on a growth path, i.e. the advantage here is that the fees are proportional to turnover.</li> </ol>	<p>Subscription for all EEA countries incl. all services, especially cross-border acquiring (e.g. BMW mobility services)</p>

Source: Project Team

### 1.5. Estimation of business volumes for ICS by wallets

The estimation of business volumes generated by international card schemes (ICS) in e-commerce transactions facilitated using digital wallets was conducted for the 14 countries. This analysis aimed to provide insights into the intersection of ICS usage, wallet adoption, and e-commerce market dynamics across a diverse set of regions. While the results offer valuable approximations, they are subject to the inherent limitations of the data sources used.

The methodology began with an examination of the usage of ICS in each of the analysed countries. These share distributions provide a foundational understanding of how ICS are utilized in e-commerce transactions within specific markets. By identifying the relative contributions of ICS to overall e-commerce payment processing volumes, the analysis ensured that the estimates were tailored to the specific characteristics of each country's landscape. Parallel to this, data on wallet usage was collected and analysed for each country. Wallet usage patterns vary significantly between countries, influenced by factors such as technological infrastructure, consumer preferences, and the availability of wallet-compatible payment systems. By capturing these variations, the analysis was able to reflect the nuanced ways in which wallets interact with ICS in each market. The assumption is made that all wallet transactions are also credit card transactions. This is necessary and possible because no precise information is available on the actual distribution, but a large proportion of all wallet transactions are card-based. Due to this assumption, the calculated value is an approximation and not an exact result. The next step involved combining these two critical datasets – the use of ICS and wallet adoption rates<sup>100</sup> – with the overall market size of e-commerce in each country. The total e-commerce market size and the usage of credit cards serves as a baseline for estimating the business volumes potentially processed through ICS and wallets. By integrating the contributions of ICS and the extent of wallet adoption, the study derived estimates of the business volumes generated by ICS specifically through wallet-enabled transactions.

It is important to highlight that this relies entirely on data sources and calculations and not on direct measurement. The data used was sourced from publicly available reports, industry analyses, and existing studies on payment systems and e-commerce trends. While every effort was made to ensure the accuracy and relevance of the data, the lack of primary data collection introduces a degree of uncertainty into the results. Furthermore, differences in data quality, availability, and granularity across countries may have influenced the precision of the estimates.

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<sup>100</sup> There is no indication that ICS branding has any influence on the use of wallets. Furthermore, Amex's significance in e-commerce in Europe is very low. Therefore, a different assessment of wallet usage for this brand would have practically no impact on our assessment of business volume.

**Box 1.1: Methodology – an example**

ICS e-commerce Market share		These values are multiplied by the wallet usage (volume) of <b>19%.</b>	Share of business volume by digital wallets	
Austria			Austria	
MasterCard	84%		MasterCard	15,96%
VISA	14%		VISA	2,66%
AMEX	1%		AMEX	0,19%

These values are multiplied by the figures for the credit card values, the result is shown in the following table.

*Source: Project Team*

As such, the results of this analysis should be interpreted as approximate rather than definitive. They are intended to provide directional insights into the role of ICS and digital wallets in e-commerce markets. However, the findings are not intended to represent exact transactional values or absolute market dynamics. Instead, they serve as an informed estimation based on the best available data and the methodological approach described. This distinction is essential for understanding the scope and limitations of the table below and for contextualizing its findings within the broader field of e-commerce and payment systems research. Diners Club International has been excluded from further analysis in this study due to its limited relevance in the e-commerce markets of the countries examined. Its market presence and usage rates were found to be negligible in the context of the 14 countries analysed, rendering it statistically insignificant for the purposes of estimating business volumes generated by international card schemes through wallet usage. As a result, the focus has been directed toward card schemes with a more substantial impact on these markets.

**Table 1.28: : Estimation of business volumes in million EUR for ICS by wallets. These volumes, referred to credit card transactions, were calculated by ICS e-commerce shares in value and wallet usage per country<sup>101</sup>**

Country	MasterCard	VISA	American Express
Austria	443,85	73,97	5,28
Czechia	94,62	77,42	0,00
Denmark	909,72	1.111,87	0,00
Greece	347,65	301,74	0,00
Hungary	111,10	27,78	0,00
Latvia	12,99	9,31	1,23
Netherlands	442,76	23,55	0,00
Poland	167,29	174,11	0,00
Portugal	115,60	173,40	0,00
Spain	3.281,83	4.964,82	168,30
Sweden	521,06	324,60	8,54

Source: GlobalData, Capgemini Research Institute

<sup>101</sup> It was not possible to provide a quantitative indication of the role of Visa, Mastercard and American Express in France, Germany and Italy, as for these countries available data did not refer exclusively to the credit card sector but also included the domestic debit schemes.

## 2. Chapter II: Positioning and consumer choices

### 2.1. Introduction

This chapter provides an extensive overview of consumer choices and behaviour in relation to current practices in the use of online payment service. It focuses specifically on the demand side of online transactions – how consumers react to different offers of payment options and the way they are displayed.

Its aim is to feed crucial information about the effects of platforms' framing and positioning of payment methods on consumer choice to the competitive analysis. In other words, whether certain arrangements between providers of payment services and e-commerce platforms can use influential factors to their advantage. For instance, payment service providers could ask to be placed at the top of the list of payment methods at check-out to aim at attracting more users. As such, a large array of payment method display practices can be used to sway consumers towards or away from specific payment methods while keeping a large offer of payment methods.

The findings gathered in this chapter and presented in the empirical evidence section are categorised into four types of influential factors.

1. External factors – all factors that are not linked to an individual's preference before being exposed to payment methods,
2. Individual factors – all factors that are linked to an individual's views and preferences before being exposed to payment methods,
3. Payment method effects – all factors that are directly linked to the payment methods and how they are displayed at the moment of decision,
4. And e-commerce platform effects – all factors that are directly linked to the platform on which the purchase is being made at the moment of decision.

The evidence backing up the findings was collected following a theoretical model that maps the different influential factors within online payment method decision making. To gather the evidence presented in this chapter the research team relied on four main data sources. An extensive literature review, a mystery shopping exercise, a representative consumer survey and a behavioural experiment. Each serving the following purpose.

- The literature review investigated the determinants of online payment method decision making.
- Mystery shopping was used to examine the various conditions display practices can manifest themselves online in the 14 selected MS.
- The representative consumer survey gathered evidence on EU citizens' online payment preference and attitudes in the 14 selected MS.
- The online experiment simulated realistic purchasing conditions and tested the influence of display practices on consumer choice of payment method in the 14 selected MS.

Before covering the main empirical evidence, the theoretical model, the four data collection methodologies and the analytical approach used in this chapter are described in detail in the next section.

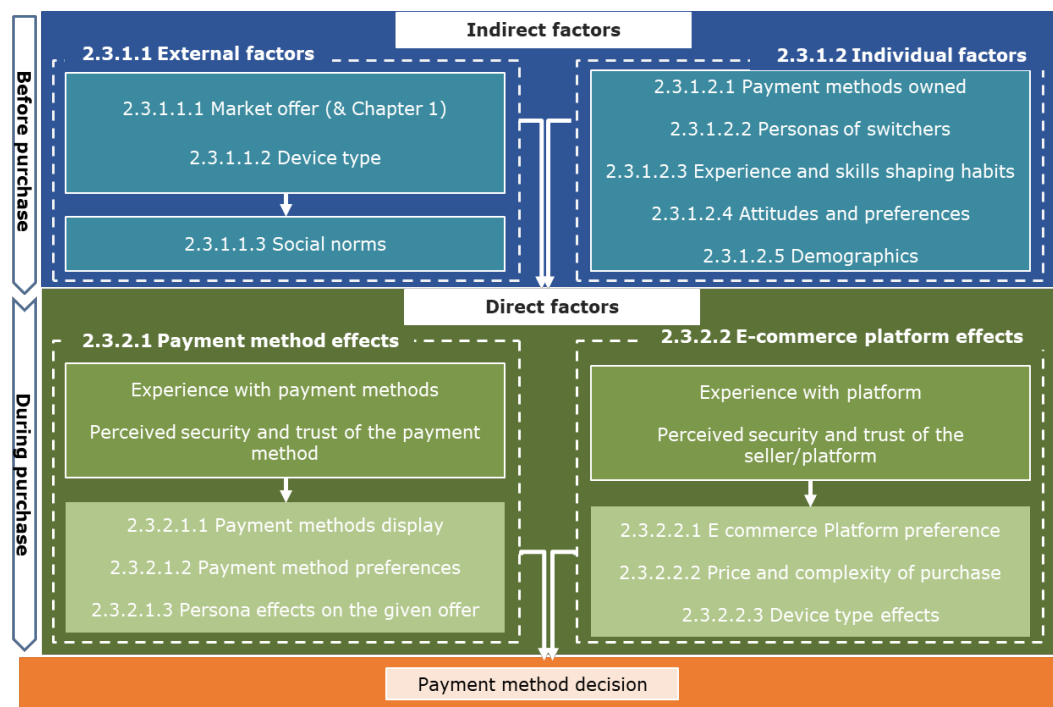
## 2.2. Methodological approach and sources of evidence

### 2.2.1. Theoretical model

Using insights from academic literature this study built a theoretical model to dissect individuals' decision-making around payment method choice. As such, the model maps the different factors that compose the decision to choose a specific online payment method.

This theoretical model was used throughout the study as theory-driven roadmap that guided the research team from the design stage of the data collection methods to the analysis of the data gathered.

**Figure 2.1: Theoretical model – Online payment method decision**



Source: Project Team elaboration

The model identifies and organises the key factors shaping such decisions logically. It first considers the timing of the decision, categorising influential factors into those that occur before the purchase and those considered during the purchase itself. This categorisation reflects how close these factors are to the actual decision. Factors before the purchase tend to be indirect and beyond the control of market players, whereas those that influence the decision at the moment of the purchase are direct and can be actively shaped by sellers.

- Indirect factors acting in the background of the decision-making process and therefore influencing the payment method choice before the purchase. These can be further divided into two broad categories, those outside of the individuals' personal characteristics (external factors) and those inside (individual factors).
- Direct factors acting in the purchase environment and therefore influencing the payment method choice during the purchase. These can be further divided into two broad categories, those relating to the payment method characteristics, i.e., how the available payment methods are presented, and those relating to the platform characteristics.

Structurally, this chapter's empirical evidence section follows the model by dedicating separate sections to each category of factors. It first examines indirect factors, beginning with external influences and then exploring individual factors. The section then shifts to direct factors, analysing how the characteristics of both payment methods and e-commerce platforms influence decision-making during the purchase.

Within the empirical evidence section, each factor is explored in detail, highlighting how it contributes to shaping payment behaviour.

Four distinct sources of evidence were used to investigate the effects of display practices on consumer choice. Starting from the literature review, each source of evidence was used to inform and design the subsequent sources, ultimately contributing to collect data and insights about the functioning of the decision-making process behind payment method selection.

The data collection methods used to inform this chapter are depicted in the figure below.

**Figure 2.2: Chapter II sources of evidence**



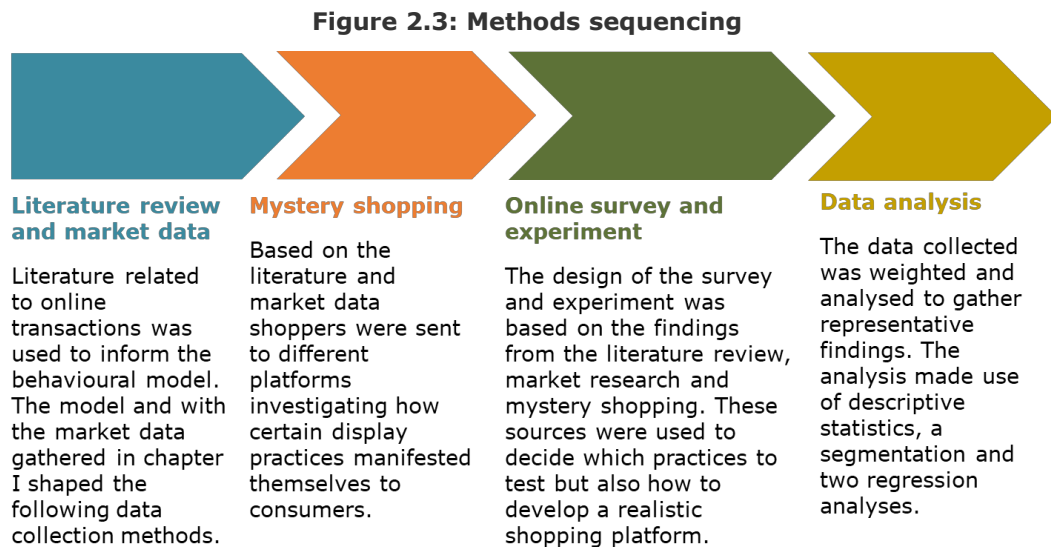
Source: Project Team elaboration

First, a literature review was conducted to gain insights about the influencers of payment method decision making. Ultimately, it was used to inform the evidence-based theoretical model and provide a solid theoretical basis for this study. Successively, the research team carried out a mystery shopping exercise designed based on the literature review and market data. A total of 70 mystery shopping observations were conducted to explore how payment options are displayed across different e-commerce platforms and devices. Lastly, an online survey featuring a behavioural experiment was designed based on the insights gained through the literature review, market research, and the mystery shopping exercise. While the survey was used to collect data on consumers' online shopping habits, attitudes, and experiences, the behavioural experiment provided an empirical picture of participants' payment method choice.

To investigate how various display practices influence consumer choice and behaviour in payment processes, substantial prior research was conducted to inform both the survey and the experimental set-up, ensuring the experiment closely replicated a real-life shopping environment. Without this focus on realism, there was a risk of participants behaving unnaturally, which could have compromised the external validity of the results and limited their applicability to actual consumer behaviour.

As such, the research process was structured in a way that each method built upon the insights of the previous one. The analysis of the mystery shopping results, and the observed behavioural effects of different display practices directly shaped the survey methodology and design.

The sequencing of methods and their corresponding sources of information are outlined in the figure below.



*Source: Project Team elaboration*

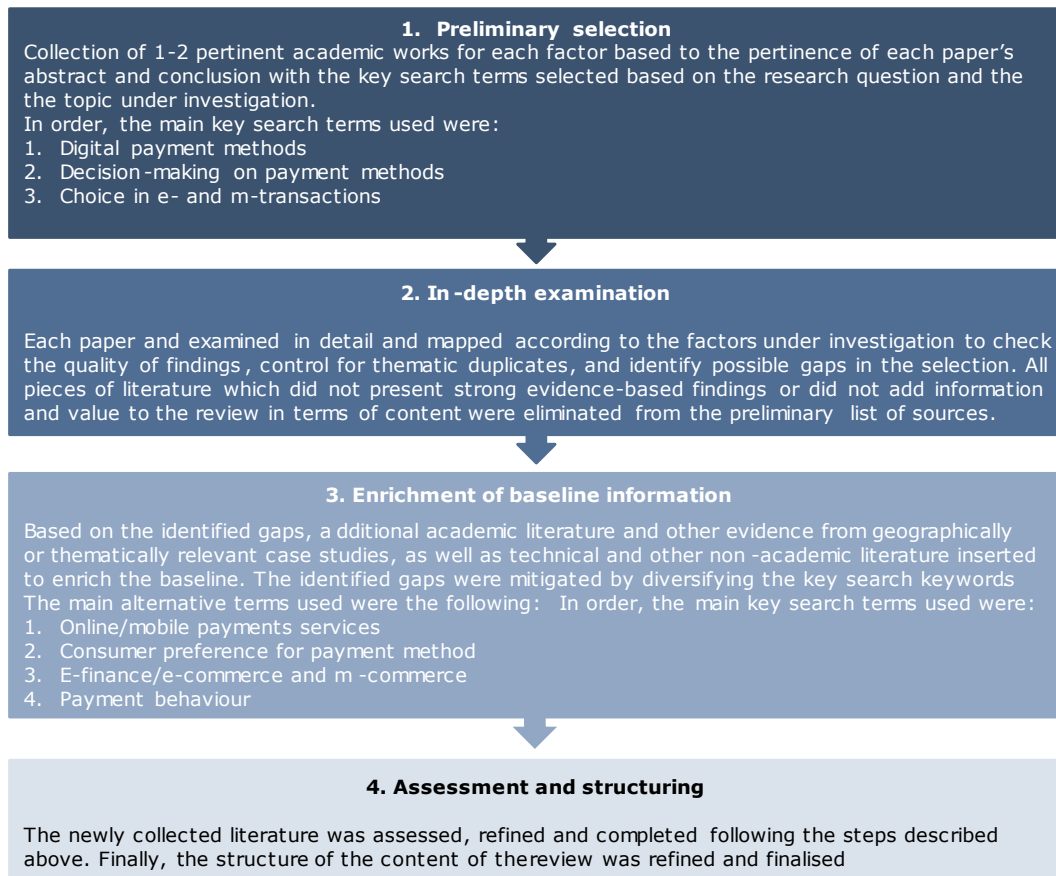
### 2.2.2. Literature review

The review was conducted to collect empirical evidence on the factors influencing payment method choice. The objective was to compile empirical evidence from a diverse range of academic and technical sources, ensuring a comprehensive understanding of consumer payment preferences. The methodology aimed to balance depth, breadth, and relevance while acknowledging limitations and research gaps around digital payment methods.

A total of 90 academic and technical sources was collected on research platforms like Google Scholar, Science Direct, APA PsychInfo, and Galileo Discovery methodology to achieve a broad coverage of approaches, methodologies, and perspectives from different academic fields for each factor.

The figure below portrays the methodological steps undertaken for the literature selection.

**Figure 2.4: Literature collection and selection methodology**



*Source: Project Team elaboration*

The literature review was an essential step in establishing a solid theoretical basis for this study. In particular, it provided precious support to three crucial aspects: firstly, a clearer picture of the impact and the behavioural mechanism behind each factor emerged; secondly, this enhanced knowledge informed a provisional list of factors which have the greatest impact on decision outcomes; and lastly, the findings were used to adjust and refine the preliminary categorisation and types of factors, as well as the evidence-based behavioural model.

The table below shows the volume of studies included in the review, together with the factors covered by them. The literature review is included in Annex C.

Table 2.1: Sources collected

	Factor type	Sub-factor	Number of studies
Internal	Sociopsychological factors		5
	Habits and past experience		9
	Ease of use and convenience		10
	Biases and heuristics	Each component	25
	Demographics		8
External	Framing effect		8
	Type of device utilised		6
	Security and trust		9
	Financial costs		5
	Business models and practices	General	1
		Default setting	8
		Up-streaming - option upfront	4
		Previously selected	1
		Information provision	1
		Offers/promotions/rewards	2
		Product recommendation	2
TOTAL			104
Actual number*			90

Source: Project Team elaboration

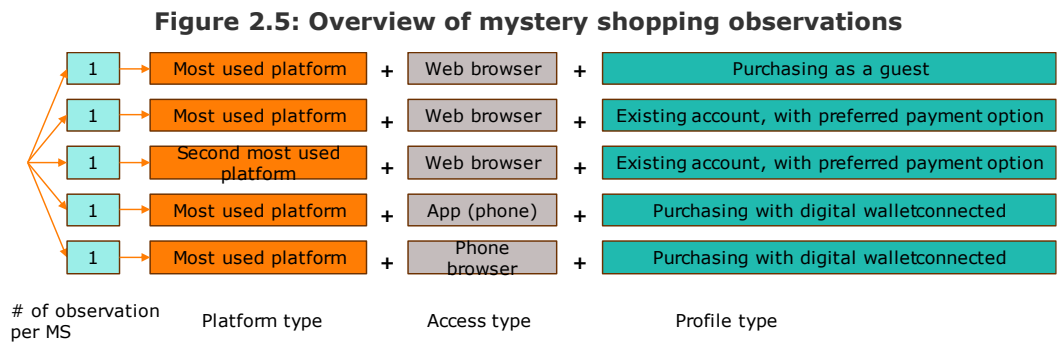
Note: \*The actual number of articles is smaller than the arithmetical sum because some articles cover more than one factor

### 2.2.3. Mystery shopping

The mystery shopping exercise was carried out between May and June 2024 across the selected 14 Member States (MSs) to address two key objectives:

1. Gain an understanding of the payment option display practices employed within the online market,
2. Collect evidence to better understand what constitutes the decision environments of consumers.

To achieve these objectives, the mystery shopping investigated the different payment methods shown to consumers and the display practices used by e-commerce platforms within their payment screen. It was designed based on the revised behavioural model and the information obtained through the literature review to replicate real-life online shopping experiences as closely as possible. To do so, the mystery shopping consisted of observations carried out in multiple Member States, on multiple e-commerce platforms, device types, browsers, and account configurations. In particular, within each MS, five different observations were collected to replicate various purchasing scenarios. The figure below illustrates the variations introduced in the five observations:



Source: Project Team elaboration

The observations were completed both on computers and on smartphones, on all major operating systems (including MacOS, Windows, iOS and Android), two different browsers (Chrome and Safari) and on the most popular platforms within each MS<sup>102</sup>.

The distinction between observations made as a guest and as registered user was introduced to simulate a situation where shoppers had made previous purchases on the platform and had a preferred payment method<sup>103</sup> with the aim of capturing the possible impact of past online payment choices on platforms’ payment options display. The observations made on smartphones were carried out to investigate whether the presence of digital wallets on the device would lead to an increase in their display among available payment methods.

As a key aim of the mystery shopping exercise was to assess the extent of prevalence of the various types of display practices that are visible online, the mystery shopping searched for and observed ten display practices that were identified during the literature review stage. For an overview, please see Table 2.2.

<sup>102</sup> As determined through data from Statista.

<sup>103</sup> The method choice was based on the most popular payment method in the given MS - see section 1.2.

Table 2.2: Display practices observed in mystery shopping

Display practice name	Technical description
Default options	<b>Default pre-selected only:</b> auto-select a payment method is the only visible option
	<b>Default pre-selected with others:</b> auto-select a payment method is shown along with other available options
Primary but not necessarily sole payment	Payment method offered with other options but is more prominent (ex., as first, bigger, framed etc..)
Up-streaming	<b>Option up-front:</b> offering a specific payment method ahead – before other options are shown in the final payment page.
Clustered options	Payment options shown under different categories
How-to guide	Show how-to guides for certain options
Monetary reference	Somewhen a monetary value is referenced along with a payment option
Logo display	Makes payment option easily noticeable and recognizable for the costumer
Added description	Provides short description of what the option is about or about how it works
Show more	When some payment options are only visible after clicking "show more" or a similar tag
Extra information banner	A message presenting the advantages of using a specific payment option or highlighting some of its qualities (e.g., 'most used method in ...'), or one presenting the negative consequences of using an option

Source: this list is the combination of literature review and mystery shopping findings, revised according to the empirical evidence.

#### 2.2.4. Consumer survey

A total of 11,532 responses were collected between November and December 2024. In each of the 14 selected countries, the survey was administered to about 800 people in two waves. The table below summarises the responses collected during the pilot phase and the main fieldwork. Representativeness was ensured using quotas on age and gender along with a weighting approach based on educational attainment.

**Table 2.3: Summary of survey responses collected per Member State**

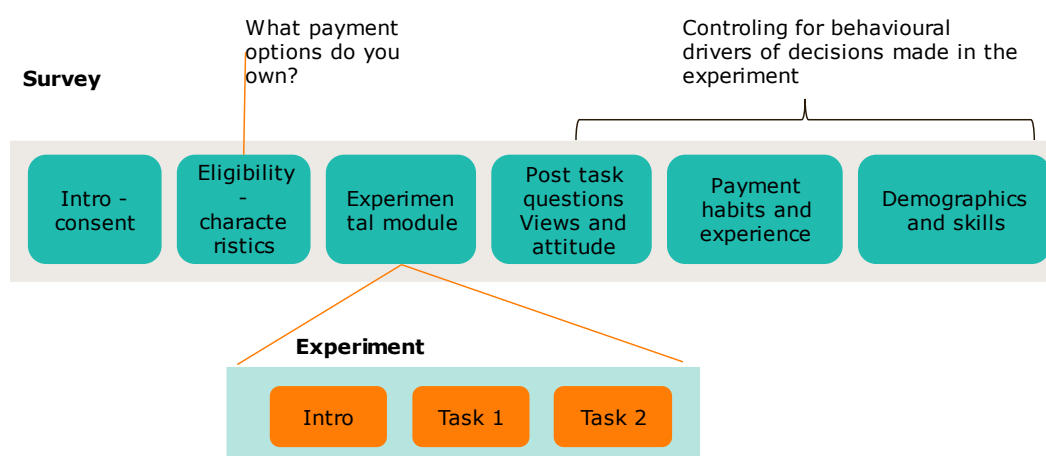
Country	Pilot phase	Main fieldwork	Total
AT	50	785	835
CZ	50	750	800
DE	50	797	847
DK	50	750	800
EL	50	750	800
ES	50	801	851
FR	50	800	850
HU	50	750	800
IT	50	801	851
LV	50	749	799
NL	50	798	848
PL	50	750	800
PT	50	801	851
SE	50	750	800
<b>Total</b>	<b>700</b>	<b>10832</b>	<b>11532</b>

Source: Project Team elaboration

The consumer survey had two main objectives:

1. Facilitate the experiment on display practices (described in subsequent sections),
2. Further understand general attitudes of consumers regarding payment methods and display practices in the EEA online space.

The figure below explains the flow of the survey including where the experiment was placed in the respondent journey.

**Figure 2.6: Survey participant journey**

Source: Project Team elaboration

The first survey module contained questions to capture eligibility and other respondent characteristics. Particularly, age and gender were registered to ensure representativeness. We also filtered the respondents so that only respondents who had

operated an online transaction in the past could participate to the survey. Successively, respondents were faced with the experimental module consisting in two tasks carried out on a mock-up shopping platform. Finally, responses on general payment behaviours and attitudes were gathered with several post-experiment questions. The content of the survey is detailed further in the questionnaire provided in separate Annex D.

### 2.2.5. Behavioural experiment

The behavioural experiment was carried out as part of the consumer survey with the objective of producing causal evidence of the influence of display practices on consumers' payment method choice. The table below depicts the display practices selected to be tested in the experiment. Each practice is described along with its rationale for selection.

**Table 2.4: Display practices included in experiment**

Display practice	Up-streaming	Default	Show-more
<b>Description</b>	A payment option is offered next to the product and if clicked will skip the payment options page	A payment option is pre-selected at checkout. Other payment methods are also present.	Full list of accepted payment options is only partially shown. An additional click is necessary to access remaining options
<b>What is shown</b>	Random payment option owned but not selected in 1st task is shown as up-streamed	Random payment option owned but not selected in 1st task is shown as pre-selected	Random payment option owned but not selected is shown in the first three options on the payment screen. Below the three options is a "show more" button that when clicked, shows a drop-down list of the rest of the payment options, including the one selected in the 1st task. If fewer than 3 payment methods are owned, other randomly selected payment methods are included in the first three options.
<b>(Potential) Merchant strategy</b>	Reducing the number of clicks and information needed	Reducing the number of clicks, easing decision.	Increasing the number of clicks needed for other payment options
<b>Rationale for inclusion</b>	High level of impact for those with exposure Medium level of prevalence. Can completely disrupt choice architecture Can completely disrupt freedom	High level of impact for everyone. Very high level of prevalence. Alters choice architectures. Medium level of freedom disruption	High level of impact for everyone. Medium to low level of prevalence Large disruption of choice architecture Medium level of freedom disruption

The experimental environment consisted in a mock-up, unbranded, e-commerce platform resembling aesthetically and functionally a popular online shopping platform. The only products present and available for purchase on the platform were a toaster

and a fridge. The two varied in price and were randomised between Decision Task 1 and 2, the two stages of the experiment. In the e-commerce platform environment, several randomised product characteristics were displayed on each model's site to simulate real-world decision-making while avoiding brand bias and irrelevant details. Certain characteristics were excluded to reduce external influences, cognitive overload, and distractions from the core task. The table below outlines the included and excluded product characteristics.

**Table 2.5: Included and excluded product characteristics in the experimental task**

Included characteristics	Excluded characteristics
Name	Brand name
Short product-specific description	Year of fabrication
Price	Frequency of purchase
Reviews (comments will be randomized)	Colour
Customer rating	
Picture	Link to seller's website
Energy performance score	

The experiment consisted of a scenario in which participants were given a task to divert their attention from the true purpose of the experiment. Specifically, they were asked to identify and "purchase"<sup>104</sup> the most energy-efficient product from the e-commerce platform. This ensured their choice of payment method was the result of an implicit cognitive process rather than a deliberate decision. By encouraging participants to rely on habit and heuristics, the aim was to increase the likelihood that they would select the same payment method they would use in a real-life situation, thus ensuring validity of the findings. To further reinforce this, we filtered the available payment methods to reflect commonly used options.

To conclude the task, participants completed a standard purchase journey, which involved adding the selected product to the basket, proceeding to checkout, and selecting a payment method. To ensure that choices reflected realistic decision-making, participants could only choose a payment method they had previously reported owning in the pre-experimental module of the survey. If a participant attempted to select a payment method they had not reported owning, they were presented with the following options:

1. Indicate that they had forgotten to report ownership of the method earlier,
2. Sign-up for the payment method to gain access,
3. Indicate that they did not mean to select that option and ask to go back to the check-out screen

The sample of 800 respondent per country was randomly allocated to one of three treatment groups, each consisting of approximately 266 respondents.

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<sup>104</sup> Participants were reminded immediately before this exercise that they would not be spending any of their personal money.

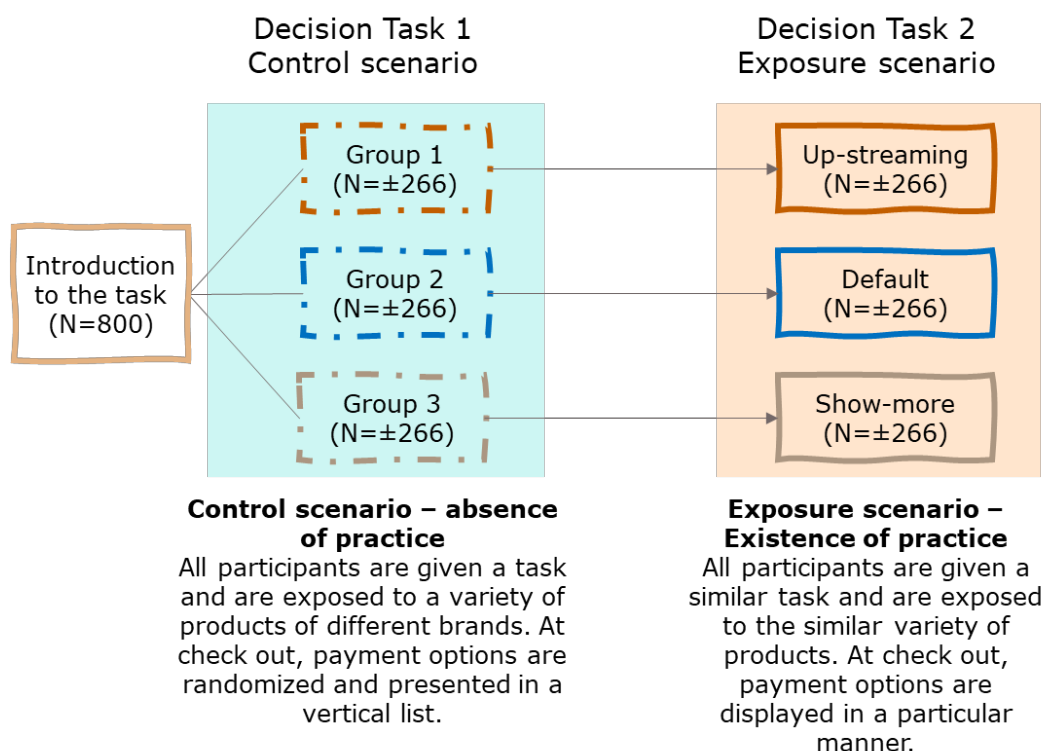
The experiment consisted of a baseline task (Decision Task 1) in which participants were not exposed to any display practice, followed by an exposure scenario (Decision Task 2) in which one of the three practices was added to the task (see Figure 2.7).

In the first iteration of the task (Decision Task 1), all respondents were exposed to the baseline scenario, which comprised a check-out page displaying all payment methods relevant to the respective Member State, arranged vertically in a randomised order.

In the second iteration of the task (Decision Task 2), respondents were randomly allocated to one of the three treatment groups, each exposed to a distinct display practice: up-streaming, default choice, or show-more. Each group received a different treatment condition, allowing for the comparison of the effects of these display practices.

The experimental design also included post-task questions aimed at controlling for potential external factors that could influence participants' decision-making, such as their perceptions of transaction costs (e.g., fees, convenience associated with different payment methods), security concerns (e.g., trust in the payment system, perceived risk of fraud, or safety of financial data) and the overall realism of the task (i.e., how closely their choices aligned with actual online shopping behaviour). These questions were designed to assess whether participants were engaging with the task in a way that mirrored real-world decision-making, rather than treating the task as a hypothetical scenario. By controlling for these factors, we aimed to increase the validity of the findings by accounting for potential biases that could influence participants' decision-making.

**Figure 2.7: Experimental design**



Source: Mystery shopping data collection

The design of the experiment to include two separate tasks was chosen such that the first task would reveal the underlying preferred payment method of the respondent, and when exposed to a display practice in Decision Task 2, would assess whether this

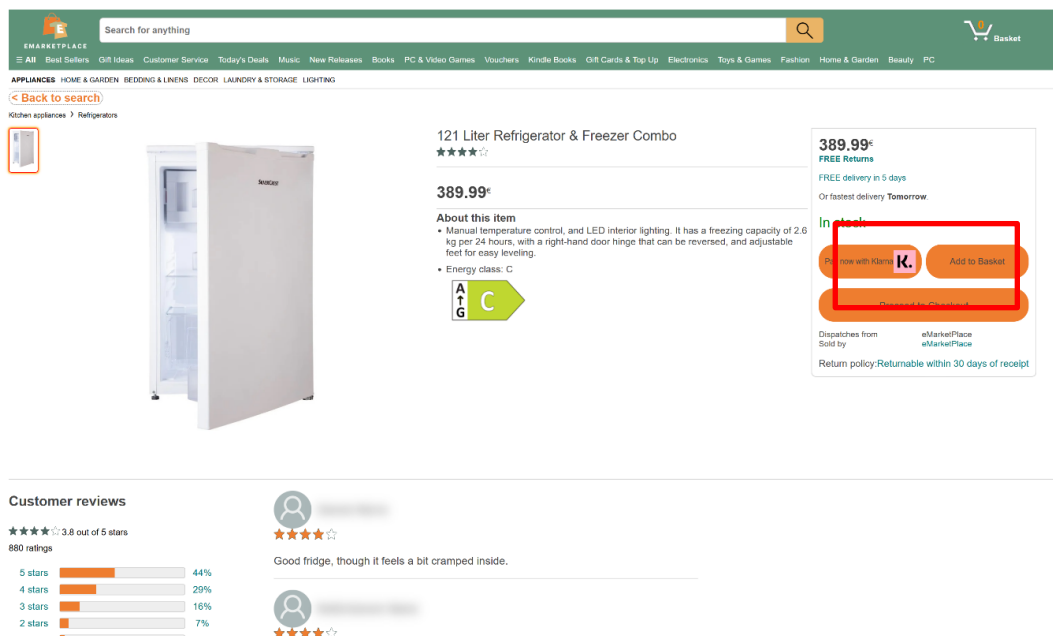
practice can influence the selection of payment method away from the preferred method. Indeed, in the absence of a display practice in Decision Task 1, individuals' preferred payment method<sup>105</sup> is revealed. The effectiveness of a display practice is then measured as whether it can induce a change from the preferred payment method from one task to another. Important to this design is how the display practices were implemented. Within each exposure scenario, the payment option selected in Decision Task 1 was artificially made less convenient to select, as follows:

1. Up-streaming – during product browsing, a payment option different than the one previously selected was put forward as faster check-out option.
2. Default – at check out, a different option than the previously selected option was set forward and pre-selected as payment option.
3. Show-more – at check out, the previously selected option was hidden under a drop-down menu that participants must click on to see their option.

The screenshots below depict how each treatment was designed in the experimental module of the consumer survey.

**Figure 2.8: Screenshots of the design of each treatment in the experimental module of the consumer survey**

### Up-streaming



### Default

<sup>105</sup> It is crucial to note that in task 1 the order of display of payment method options was randomised between each respondent. This allows the research to set-aside any potential ordering effects.

Step 1

Step 2

Payment

Your payment methods:

☒ Google Pay

☐ Klarna

☐ Credit or debit card

☐ Paysafecard

☐ EPS

☐ Apple Pay

☐ PayPal

☐ Bank transfer

Use this payment method

Items: 22.99€

Order Total: 22.99€

Show more

Step 1

Step 2

Payment

Your payment methods:

☐ Bank transfer

☐ PayPal

☐ Apple Pay

show more

Use this payment method

Items: 389.99€

Order Total: 389.99€

Step 1

Step 2

Payment

Your payment methods:

☐ Bank transfer

☐ PayPal

☐ Apple Pay

☐ Paysafecard

☐ Google Pay

☐ Credit or debit card

☐ Klarna

☐ EPS

show less

Use this payment method

Items: 389.99€

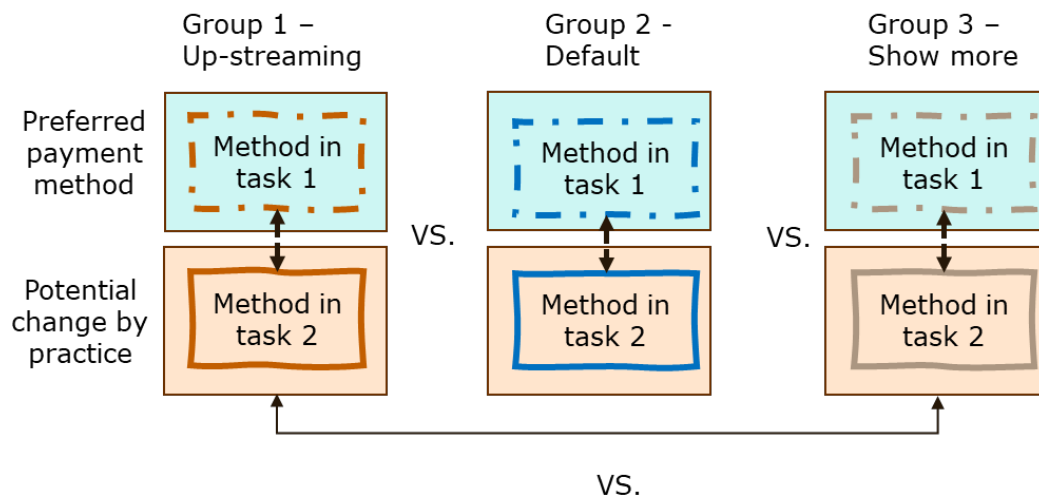
Order Total: 389.99€

Source: Project Team elaboration

Accordingly, as the preferred option was made less convenient to select in Decision Task 2 because of the display practice, if the participant ended up changing to the option(s) promoted by the display practice, the display was confirmed to have affected consumer choice. As such, the experiment was designed such that the primary outcome variable to assess the effectiveness of a display practice was whether the respondent selected a

different payment option in Decision Task 2 than the one selected in Decision Task 1. A further differentiation was made between respondents who switched their chosen payment method to the method which was nudged onto the participant by the display practice and those who switched their chosen payment method to a different option not suggested or pushed by the display practice.

**Figure 2.9: Outcome variable - comparison of payment method within groups and between display practices**



Source: Project Team elaboration

The overall effect of each display practice on consumer behaviour was assessed by analysing the changes in payment method between Decision Tasks 1 and 2, whether respondents change payment methods from their preferred choice when exposed to a display practice, and whether this effect is greater for some display practices over others. Post-task question responses were added in this comparison to account for individual differences in attitudes toward variables such as security, convenience, and other costs.

### 2.2.6. Analytical approach

The data collection activities and sources of evidence informed the theoretical model and were integral to understanding consumer behaviours and how they respond to display practices. The analysis of qualitative information gathered through the mystery shopping provided necessary context and further empirical evidence was gathered through the consumer survey. The analytical approach of the consumer survey plays an important role in how we can use the data collected to make conclusions about consumer behaviour. In all cases, the analytical methods were tailored to reflect realistic consumer scenarios to provide a comprehensive analysis.

The consumer survey, as well as the behavioural experiment, was analysed through descriptive and inferential statistics. Demographic weights were calculated to ensure that the samples were representative of the online population and would reflect an accurate picture of broader consumer attitudes and behaviours in online payment scenarios.

Inferential statistics played a key role in two areas of the analysis. As a first step, a segmentation of the population was produced considering consumers' behaviour in relation to payment method ownership and usage. Using this segmentation, a model was developed to understand which factors affected the likelihood of a respondent to fall into a specific segmentation group. A combination of basic and extended models

helped us explore the influences of sociodemographic characteristics alongside other factors.

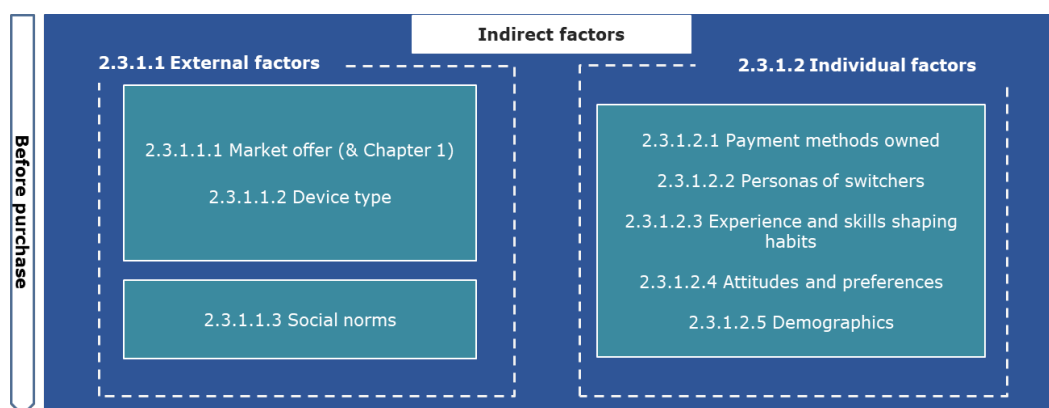
Second, statistical models were used to assess the outcomes of the behavioural experiment. For two of the tested scenarios, models were built to estimate the likelihood of participants switching their payment method based on exposure to different display practices. A third model examined position of the selected payment method within the experiment's task and whether after exposure to the display practice, respondents selected payment methods that appeared higher on the payment screen. Together, these models provided a robust understanding of how display techniques affect consumer decisions.

## 2.3. Empirical evidence

### 2.3.1. Indirect factors – before the purchase

Indirect drivers are the influential factors that act in the background of the decision-making process. As such, these factors exist and influence payment method choices before the purchase. They can be split into two broad categories, those outside of the individuals' personal characteristics (external factors) and those inside (individual factors). Both categories and their sub-categories are described in the sections below.

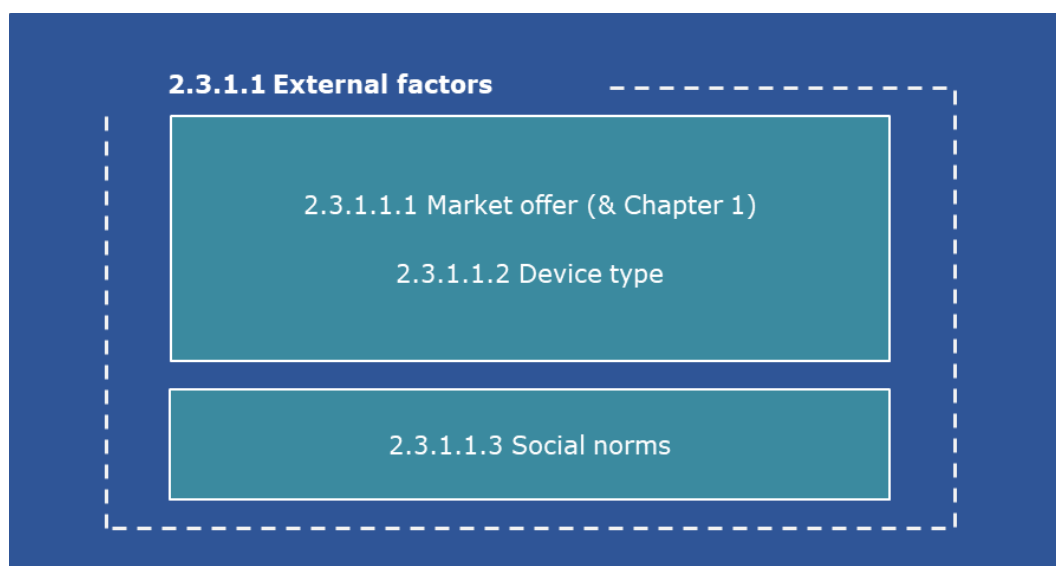
**Figure 2.10: Indirect factors**



Source: Project Team elaboration

#### 2.3.1.1. External factors

Within the broad category of factors indirectly affecting payment method decisions, external factors play a key role in shaping the environment in which these decisions are made. These factors operate outside an individual's personal attributes, yet interact with individual preferences, and create contextual conditions that can affect the decision-making process. While they do not directly determine the outcome, they do shape the context in which choices are evaluated.

**Figure 2.11: External factors**

*Source: Project Team elaboration*

This sub-section covers three external factors that may indirectly influence decision making of consumers in online payment decisions: the market offer, the type of device used, and social norms. The following sub-sections depict the evidence gathered on each factor and demonstrates how these can affect decision making.

#### **2.3.1.1.1. Market offer**

Beyond the external factors examined in this study, the e-commerce market also shapes the environment in which payment decisions are made. The availability of specific payment methods, the presence of major e-commerce platforms, and the overall digital payment infrastructure in a given country, define the options consumers have at their disposal. Thus, they create the conditions under which consumers make their decisions. For example, the availability of specific payment methods on major e-commerce platform like Amazon positively impact their usage among customers and, in turn, increase their acceptance among merchants. As it will be discussed in section 3.2.1, merchant choice is primarily driven by the need to minimise drop-off rates at checkout while managing transaction costs. Certain payment methods, such as ICS, are considered must-haves due to their widespread consumer adoption. Additionally, contractual arrangements with payment method providers can influence merchant acceptance, as providers may offer financial incentives or impose conditions such as preferential display placement, further shaping the payment options available to consumers. Equally important is how these methods are displayed, as this can impact consumers' decision-making process.

Although direct data on the market offer across the 14 Member States examined is analysed in chapter 1, the consumer survey results can further corroborate the understanding of market structure and dynamics and provide an important contextual factor when interpreting consumer payment behaviours. The structure of the digital payment marketplace not only determines what payment options are accessible but also reflects how consumers engage with them, reinforcing the role of display practices in shaping payment choices.

### 2.3.1.1.2. Device type

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#### Key take-aways

- Smartphones are the primary and preferred device for online shopping, with 61% of respondents choosing them for their ease of use anywhere (82%) and streamlined payment process (78%).
  - Frequent buyers particularly favour smartphones for their purchases. While 66% of respondents prefer using apps over browsers for online shopping, only 25% believe payments are safer through apps than on websites. Additionally, studies suggest a link between smartphone addiction and the use of mobile wallet payment methods.
  - E-wallets are commonly used on mobile devices (smartphones and tablets) due to their convenience and perceived security over physical cards, although 58% of respondents still have safety concerns.
  - Payment preferences vary across countries, with distinct device-based preferences observed in different Member States.
- 

The type of device used for an online purchase directly influences the payment methods consumers are presented with, and consequently, the options they can choose from. In other words, what consumers choose to use as a payment method is often determined by the options that are offered to them based on the device they are using. The availability and visibility of payment methods can differ depending on whether a consumer is using a smartphone, or laptop, as well as the specific operating system.

This dependency is suggested by the mystery shopping findings which show variations in the payment methods offered across different devices and operating systems<sup>106</sup>. For example:

- Credit/debit cards are universally offered across all devices, appearing 100% of the time on all operating systems.
- Bank transfers are more commonly shown on Android (86%) and iOS (79%) compared to Mac (60%), with less frequency on Windows where gift cards and other vouchers rank second. This suggests bank transfers are more prominent on smartphones.
- Gift cards and digital wallets (e.g., Google Pay and Blink) are more likely to appear on Android (36%) and iOS (64%) – thus when the purchase is carried out on a smartphone - while Paypal is more common on Mac (40%) and Windows (58%).

While these findings are likely due to the variations<sup>107</sup> introduced by the mystery shopping methodology, there are findings that suggest interesting patterns. Google Pay was more frequently offered on Android smartphones than iOS devices, and it was more commonly associated with Windows devices, suggesting that digital wallets are more commonly offered in their respective environments.

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<sup>106</sup> To account for differences in the number of payment options offered by various platforms, we normalised the ranking of payment methods, enabling comparison across different websites.

<sup>107</sup> These variations are introduced by several factors, including differences in device functionality, app-specific payment integrations, and platform-specific settings.

Apple Pay was more prominent, i.e., appeared higher in the list of available payment options, on iOS devices compared to Android devices<sup>108</sup>, but it appeared even prominently on Windows devices. This result, however, is based on a singular observation of Apple Pay being offered rather prominently, which when continuing further in the payment process, disappears. This suggests that payment options can be displayed but may not always be available depending on the device. In this case, the Apple Pay logo appeared as a graphic without the actual payment functionality.

One potential explanation for this could be the way APIs are structured. APIs, which allow different systems to communicate, may trigger the display of a certain payment options, like Apple Pay, even if they are not activated by the users. The API likely detects the device (e.g., iOS) and prompts merchants to show Apple Pay as an option<sup>109</sup>. However, it was not possible to assess the reasons behind this observation as part of the mystery shopping exercise.

While it was not possible to assess the reasons behind this observation as part of the mystery shopping, APIs play an important role in determining which payment methods are shown to consumers. In fact, the display and the availability of payment methods is influenced by the way APIs are designed and implemented. The way APIs are set up can impact both the functionality and the visibility of payment options. For example, a deeply integrated API can prompt payment options like Paypal or Apple Pay to appear automatically on the device, even if they are not activated. On a broader scale, smartphones are by far the preferred device used for online shopping. According to the survey findings, 61% of respondents indicated that they prefer using smartphones for online shopping, while 46% selected laptops, as shown in the graph below.

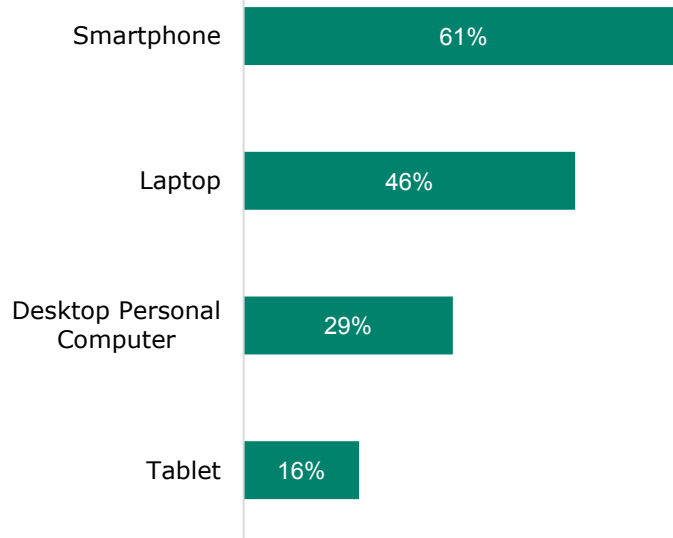
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<sup>108</sup> Apple Pay is not available on Android for making purchases. However, the Apple Pay logo may still appear as a payment option when shopping online.

<sup>109</sup> [https://developer.apple.com/documentation/apple\\_pay\\_on\\_the\\_web/apple\\_pay\\_js\\_api/checking\\_for\\_apple\\_pay\\_availability](https://developer.apple.com/documentation/apple_pay_on_the_web/apple_pay_js_api/checking_for_apple_pay_availability).

**Figure 2.12: Preferred devices for online shopping**

G2. Which of the following devices do you typically use to shop online? (N=11532)



*Source: Consumer survey*

This is an interesting finding considering that research indicates that consumer impulsiveness varies by device, with smartphone users displaying higher levels of impulsive buying. Smartphone users report weaker impulse control and are less inclined to invest time in decision-making<sup>110</sup>.

The survey findings from this study highlight a relationship between the type of device preferred for online shopping and the frequency of purchases. The data shows that the highest percentage of purchases made "more than once a week" occur via smartphones. Furthermore, there is a clear pattern: as the frequency of online shopping increases, the preference for using a smartphone also rises. This suggests that those who shop more frequently tend to prefer smartphones for their purchases, as illustrated in the graph below.

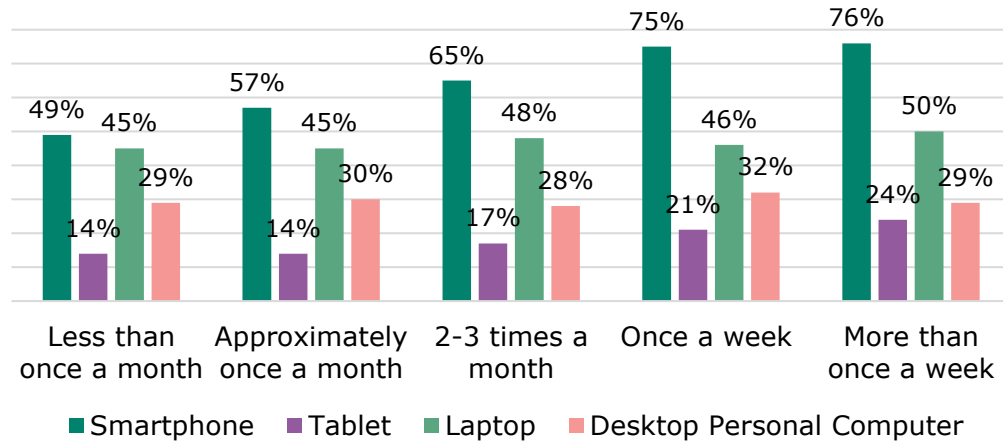
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<sup>110</sup> Tounekti, O., Ruiz-Martínez, A., & Skarmeta Gómez, A. F. (2019). Users Supporting Multiple (Mobile) Electronic Payment Systems in Online Purchases: An Empirical Study of Their Payment Transaction Preferences. *IEEE Access*, 8, 735-766. doi: <https://doi.org/10.1109/ACCESS.2019.2961785>.

**Figure 2.13: Frequency of purchases by device (N= 11532)**

G2. Which of the following devices do you typically use to shop online?

E4. On average, how frequently did you make online purchases in the last year with a payment method under your name?



Source: Consumer survey

Notably, there is also literature evidence of a correlation between smartphone addiction and the use of mobile wallet payment methods<sup>111</sup>. Survey data consistently indicates that e-wallets are more commonly used for online shopping when the preferred device is a smartphone. This is true in 13 out of 14 Member States. Among those who prefer shopping via smartphones, the percentage of digital wallet ownership or usage for online purchases is higher compared to those who favour laptops, as shown in the graph below. France is the only exception to this trend.

<sup>111</sup> Shaw, B., & Kesharwani, A. (2019). Moderating Effect of Smartphone Addiction on Mobile Wallet Payment Adoption. *Journal of Internet Commerce*, 18(3), 291-319. <https://doi.org/10.1080/15332861.2019.1620045>.

Figure 2.14: Wallet usage by device across countries

Device	AT	CZ	DE	DK	EL	ES	FR	HU	IT	LV	NL	PL	PT	SE
Smartphone	33%	58%	38%	50%	43%	29%	27%	53%	27%	37%	37%	37%	79%	44%
Tablet	34%	64%	37%	41%	40%	25%	30%	55%	29%	33%	28%	41%	74%	40%
Laptop	25%	48%	22%	37%	36%	23%	28%	51%	19%	31%	28%	25%	74%	35%
Desktop	23%	43%	22%	33%	33%	18%	28%	49%	18%	28%	23%	21%	61%	33%

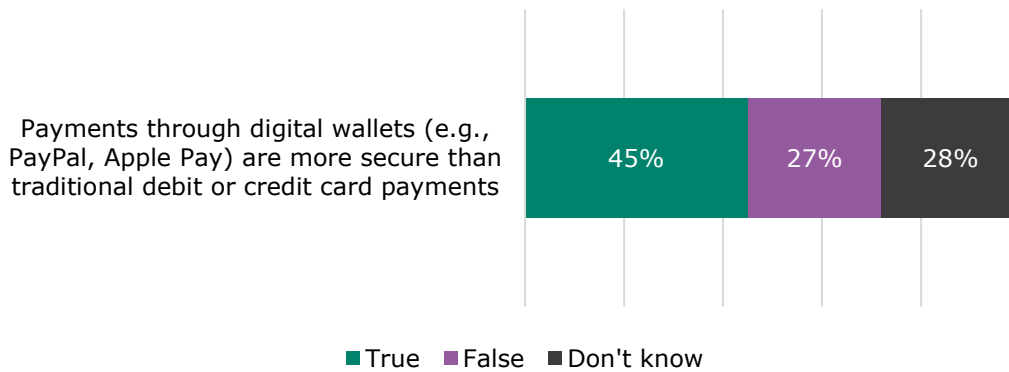
Source: Consumer survey

While the mystery shopping exercise focused solely on smartphones and laptops, the survey expanded the analysis by including two additional devices: tablets and desktop personal computers. Notably, the phenomenon observed with smartphones—higher adoption of digital wallets—also extends to tablets. In fact, in some countries (e.g., AT, CZ, FR, HU, PL), tablet users even show higher percentages of digital wallet usage than smartphone users, reinforcing the association between mobile devices and the preference for e-wallets in online shopping.

This aligns with the perception of security as 4 in 10 respondents believe that paying through digital wallets is safer than using traditional debit/credit cards. Despite this positive perception of safety, a combined 55% either disagree or are unsure, indicating that while digital wallets are popular for their convenience, their safety is not universally trusted.

**Figure 2.15: Perceived security of digital wallets**

G5. In your opinion, which of the following statements are true or false? (N=11532)



Source: Consumer survey

When looking at the distribution of payment methods adoption by device and country, payment method preferences vary among respondents who selected smartphones as their preferred device, depending on the country. Online banking is the most widely adopted method in 7 out of 14 countries (CZ, HU, FR, LV, NL, PL, PT). Paypal is the leading choice in 4 countries (AT, DE, ES, IT). In comparison, international cards have consistently high shares in 2 countries (FR, EL), while other digital wallets are most popular in DK.

Figure 2.16: Payment method adoption on smartphones by country

Payment methods	AT	CZ	DE	DK	EL	ES	FR	HU	IT	LV	NL	PL	PT	SE
International cards	67%	65%	47%	68%	80%	76%	70%	55%	70%	49%	33%	60%	63%	61%
Domestic cards	29%	0%	16%	27%	0%	5%	13%	0%	28%	0%	5%	0%	34%	8%
Paypal	73%	60%	89%	62%	68%	79%	68%	69%	78%	54%	61%	65%	65%	52%
Big Tech wallets (Apple Pay, etc.)	33%	58%	38%	50%	41%	29%	27%	45%	27%	37%	37%	37%	23%	44%
Online banking and methods based on online banking	68%	81%	60%	50%	48%	68%	34%	80%	43%	95%	98%	98%	83%	88%
"Buy now pay later" and "pay in instalments" platforms	50%	14%	53%	18%	17%	9%	13%	0%	14%	2%	45%	0%	14%	67%
Prepaid voucher	0%	0%	23%	81%	5%	0%	0%	23%	0%	0%	0%	0%	0%	0%
Other	8%	13%	2%	1%	16%	5%	5%	8%	7%	5%	1%	11%	5%	1%

Source: Consumer survey

Note: The percentages are based on survey responses from different questions. The first two rows (International cards and cards different from ICS) come from question Q6 (credit/debit card ownership), while the remaining rows come from question E5 (payment method ownership). To simplify the analysis, payment methods were grouped into broader categories. Respondents were counted as owning a category if the owned at least one payment method within it. For example, owning Google Pay but not Apple Pay would still count as owing a Big Tech wallet. The online banking category includes several payment methods, making it broader than other categories. Some countries (CZ, EL, HU, LV, PL) have no cards different that ICS included in this question, which is why their percentage is 0%. Since respondents could own multiple payment methods across different categories, totals exceed 100%.

\*In some instances, where cards different than ICS are not available, respondents reported they own cards of different countries.

Like smartphones, laptop payment preferences vary by country. Online banking was most common in 7 countries (CZ, HU, LV, NL, PL, PT, SE), while international cards dominated in 3 (AT, EL, ES). Paypal was preferred in Germany and Italy, while domestic cards are the leading choice in France. Other digital wallets are most popular in Denmark, showing regional trends and differing device-based preferences across Member States.

The channel used for online purchases, whether a mobile app or a browser, can also shape the environment in which payment method decisions are made. This is because the way users interact with these interfaces, the cognitive load required, and the way payment methods are presented can vary between apps and browser, influencing how consumers make decisions. However, while the literature review offers valuable insights into online payment behaviour, there is a gap in specific comparison between app-based and browser-based purchases.

Previous research shows that mobile app usage tends to be more task-oriented, focusing on specific actions like making a purchase or checking order status. On the other hand, browser usage often involves more exploration-oriented behaviour, such as browsing multiple products or comparing prices across different websites<sup>112</sup>.

These differences also affect the cognitive effort required. Mobile apps, designed for streamlined interactions and simplified interfaces, often reduce cognitive load during transactions, leading to smoother check-out experiences<sup>113</sup>. In contrast, browsers may require more navigation steps, potentially increasing decision fatigue and affecting purchase completion rates.

This study's survey results align with these findings. The primary reason respondents use smartphones for online purchases is the ability to shop from anywhere (82%), with 78% citing a streamlined payment process as a key motivator. Furthermore, many respondents (66%) prefer using apps over browsers for online shopping. The graph below illustrates the reasons for smartphone use during online transactions.

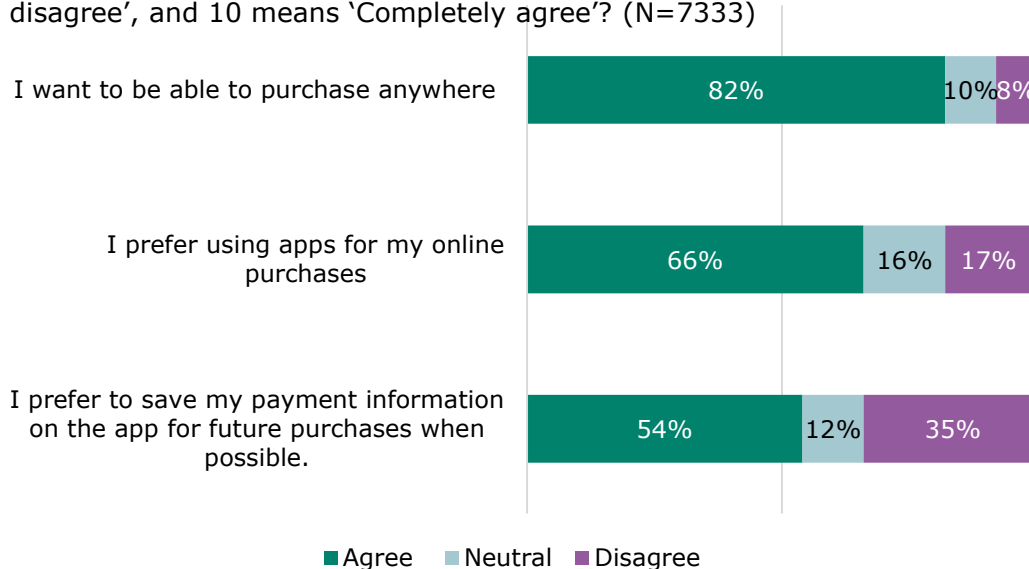
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<sup>112</sup> Raphaëli, O., Goldstein, A., Fink, L., 2017. Analyzing online consumer behavior in mobile and PC devices: a novel web usage mining approach. ECRA 26, 1–12. <https://doi.org/10.1016/j.eierap.2017.09.003>.

<sup>113</sup> Łysik, Ł., Kutera, R., & Machura, P. (2014, November). Behavioural and technical factors of influence on purchase behaviour of mobile consumers. In *Proceedings of the 18th International Academic MindTrek Conference: Media Business, Management, Content & Services*.

**Figure 2.17: Reason for smartphone use during online shopping**

G3. You stated typically using a smartphone to make online purchases. Please rate the following statements on a scale from 0 to 10 where 0 means 'Completely disagree', and 10 means 'Completely agree'? (N=7333)



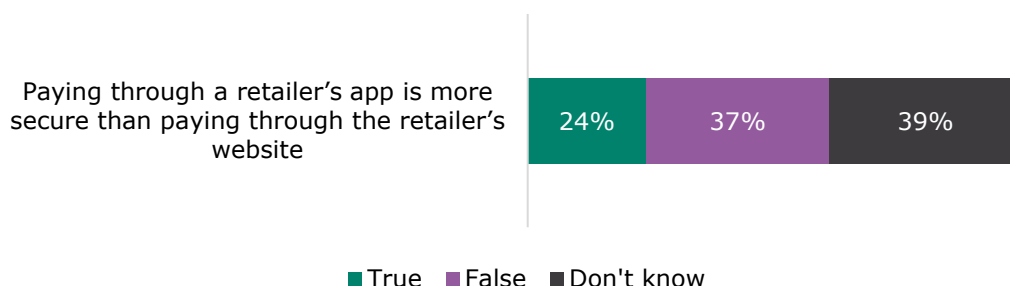
Source: Consumer survey

Note: The response rate reflects that the question was filtered to include only those who selected a smartphone as their preferred device for online purchases (unweighted base).

Although apps are the preferred medium for online purchases, only 24% of respondents believe that payments are safer on the retailer's app compared to the website. This suggests that factors other than perceived security, such as ease of use and simplified payment processes, may be more influential in driving the preference for apps.

**Figure 2.18: Perceived payment security - App vs. Website**

G5. In your opinion, which of the following statements are true or false? (N=11532)



Source: Consumer survey

However, just as the device used influences the payment methods consumers are presented with, the order of available payment methods also varies depending on the account configuration. The mystery shopping analysis revealed that e-commerce platforms can prioritise certain payment methods when shoppers make purchases using a user account. This suggests that e-commerce platforms might have preferences for shoppers using specific payment methods, potentially influenced by factors such as user

experience and costs considerations. For instance, payment methods like Apple Pay, bank transfers, and financing options tended to rank higher, meaning they appeared higher in the list of available payment options, for account holders. This applied both to apps and browser purchases, depending on the user's account configuration. These platforms-specific dynamics underscore the complexity of the environment in which consumers make their decisions, indirectly affecting their payment method choice.

### 2.3.1.1.3. Social norms

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#### Key take-aways

- 8 in 10 respondents have a clear opinion on what others do or value when shopping online, indicating well-defined social expectations: most people value convenience over safety (62%), tend to be less careful on reputable e-commerce platforms (72%), and are unlikely to use a payment method they have not used in the past (61%).
  - Confidence in consumer protection authorities vary across Member States.
  - The availability of a preferred payment method on an e-commerce platform strongly influences consumer behaviour, with 74% of respondents preferring to purchase from a different store rather than set up a new payment method. Respondents in some of the countries with higher trust in consumer protections authorities are more willing to adopt new payment methods.
- 

Norms refer to the influence of social processes on consumers' behaviour. Prior research shows that other people's behaviour, personal preferences, and experiences, as well as, social norms, shape how consumers perceive e-commerce and their payment decisions<sup>114 115</sup>.

Social norms play an important role in forming individual preferences<sup>116</sup>, creating a tension between informed decision-making and social conformity<sup>117</sup>. Both descriptive norms (what others do) and injunctive norms (social approval) affect consumer behaviours<sup>118</sup>. For instance, studies on mobile payment highlight that social antecedents, i.e., subjective norms (social pressure from others) and network externalities (the increasing value of a payment method as more people use it), affect

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<sup>114</sup> Uldall, B.R. (2013). Social Psychology. In: Runehov, A.L., & Oviedo, L. (eds), *Encyclopedia of Sciences and Religions*. Springer, Dordrecht. [https://doi.org/10.1007/978-1-4020-8265-8\\_1047](https://doi.org/10.1007/978-1-4020-8265-8_1047).

<sup>115</sup> van der Cruysen, C., & van der Horst, F. (2016). Payment behaviour: the role of socio-psychological factors. De Nederlandsche Bank Working Paper 532/2016.

<sup>116</sup> Kosse, A., & Jansen, D. (2011). Choosing how to pay: the influence of home country habits. De Nederlandsche Bank Working Paper N. 328/2011. [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1977192](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1977192).

<sup>117</sup> Lipari, F. (2018). This Is How We Do It: How Social Norms and Social Identity Shape Decision Making under Uncertainty. *Games*, 9(4), 99. <https://doi.org/10.3390/g9040099>; Ajzen, I. (1996). The social psychology of decision making. In: Higgins, E.T., & Kruglanski, A.W. (Eds.), *Social Psychology: Handbook of basic principles*, (pp-297-325). Guilford Press, New York.

<sup>118</sup> Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological Science*, 18(5), 429-434. <https://doi.org/10.1111/j.1467-9280.2007.01917.x>; Melnyk, V., van Herpen, E., Jak, S., & van Trijp, H. (2019). The Mechanisms of Social Norms' Influence on Consumer Decision Making. A Meta Analysis. *Zeitschrift für Psychologie*, 227(1). <https://doi.org/10.1027/2151-2604/a000352>.

consumer attitudes towards payment methods<sup>119</sup>. Crowd influencing, i.e. the perceived social pressure to act or not to act, has also been found to have a direct impact on online payment behaviour<sup>120</sup>. When individuals perceive that most people in their social circle are adopting a certain behaviour, such as using a particular online payment method, they are more likely to adopt that behaviour as well.

In this sub-section, we focus specifically on perceptions of injunctive norms and how these perceptions may shape consumer behaviour. To explore this, we analysed responses to survey items probing perceptions of what most people value or do during online shopping. The survey revealed the following:

- 62% of respondents believe that when shopping online, most people value convenience over safety.
- There is a perception that people are less careful during the payment process on e-commerce platforms with a good reputation (72%), suggesting that trust in the e-commerce platform influences perceived caution.
- 6 in 10 respondents indicated that people are unlikely to choose a payment method they have not used in the past, emphasising the role of familiarity in payment method decisions.

On average, 84% of respondents expressed a clear opinion on what they believe others do or value when shopping online, indicating that social expectations around e-commerce behaviours are well-defined. This suggests that perceived social norms play a role in shaping consumer behaviour, as most people are confident in understanding what others would approve of or expect.

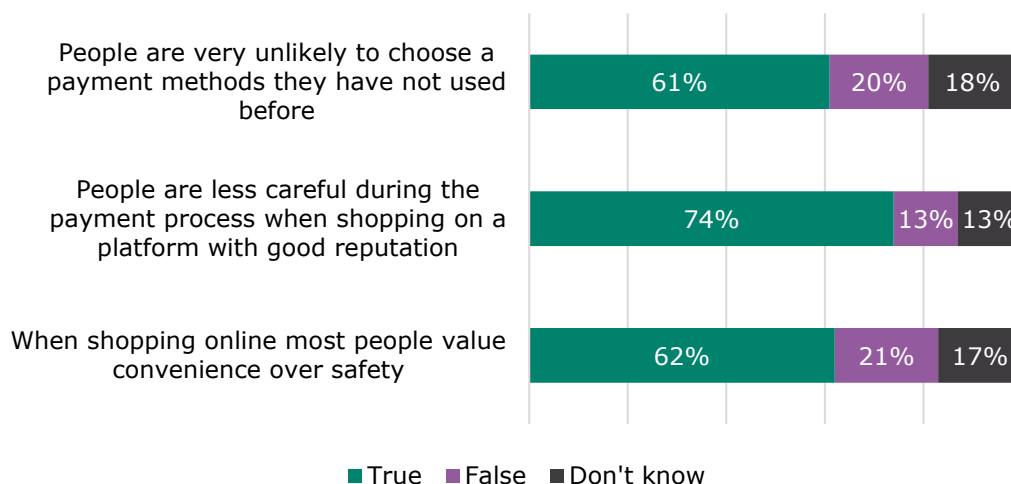
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<sup>119</sup> Zhang, J. & Mao, E. (2019). Cash, credit, or phone? An empirical study on the adoption of mobile payments in the United States. *Psychology and Marketing*, 37(1). <https://doi.org/10.1002/mar.21282>; Nur, T., & Panggabean, R. (2021). Factors Influencing the Adoption of Mobile Payment Method among Generation Z: the Extended UTAUT Approach. *Journal of Accounting Research, Organization and Economics*, 4(1), 4-28.

<sup>120</sup> Hoa, N., Hien, L., & Lien, V. (2019). Studying the factors affecting online payment decision: a case of Vietnamese costumers. *Journal of Management Information and Decision Sciences*, 22(1). 1532-5806-22-1-124.

**Figure 2.19: Consumer perceptions of norms in online shopping**

G5. In your opinion, which of the following statements are true or false? (N=11532)



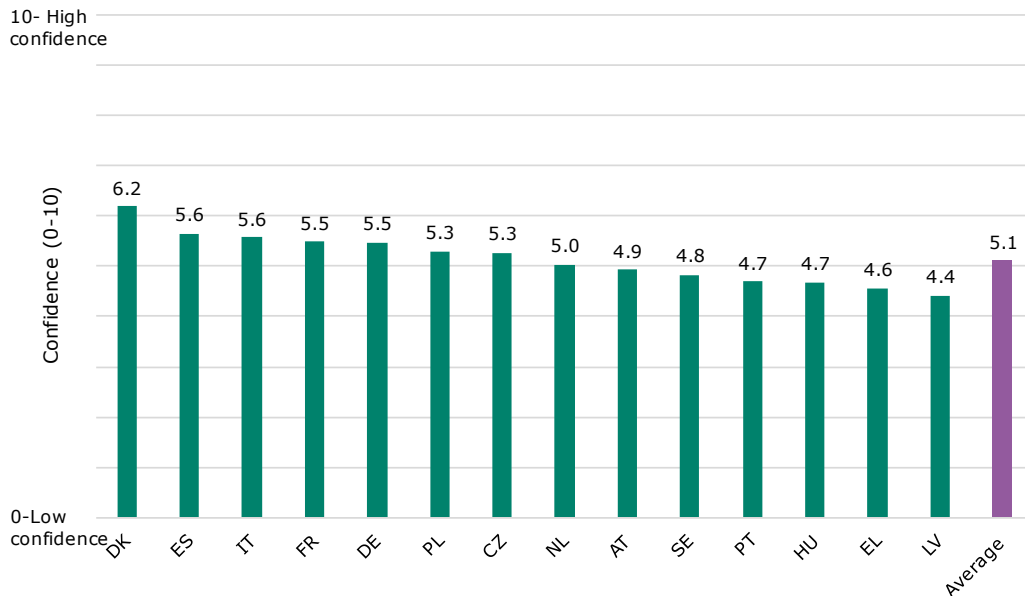
Source: Consumer survey

While injunctive norms appear to normalise prioritising convenience, trusting well-known e-commerce platforms, and relying on familiar payment methods, these norms interact with individual mental models, i.e., personal beliefs about risk, effort, and security, which also shape behaviour.

In this context, perceptions of consumer protection within a country can influence how people approach online payments. Respondents' confidence in the ability of institutions to resolve issues like unauthorised transactions varies widely across regions. Among respondents in countries like Greece (4.6), Hungary (4.7), Latvia (4.4), and Portugal (4.7), the mean confidence in consumer protection mechanisms is lower. In contrast, Denmark (6.2), Italy (5.6), and Spain (5.6) have higher mean confidence levels, indicating greater trust in these systems.

**Figure 2.20: Perceived trust and confidence in consumer protection (Average values)**

H7. If a payment method were to be used without your permission, how confident are you that the issue would be resolved by either the payment provider (e.g., bank reimbursing you) or public authorities (e.g., police)? Please rate your confidence on a scale



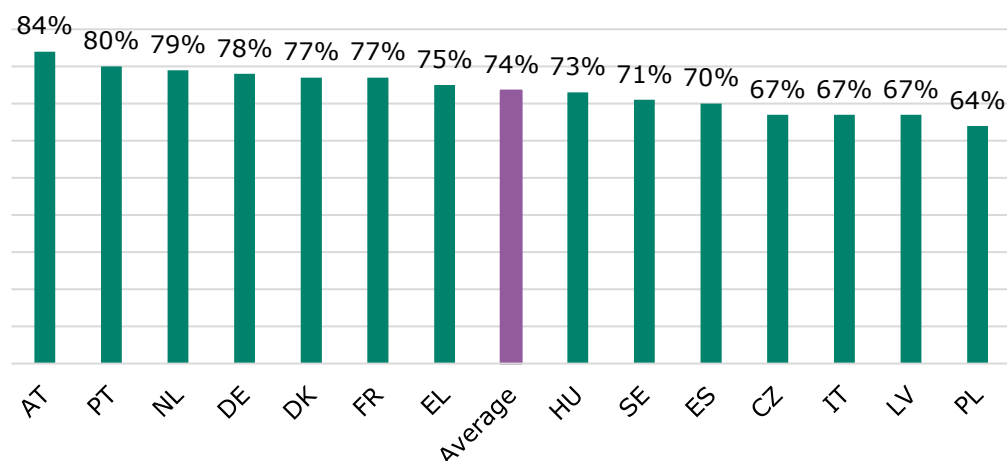
Source: Consumer survey

When examining respondents' willingness to change their payment method when their preferred option is not available on the e-commerce platform they're shopping from, 74% stated they would rather purchase from a different store that supports their existing payment method than set up a new one. This shows that payment method availability is a crucial factor influencing consumer decisions, often taking the precedence over platform loyalty. Consumers would rather find an online store that supports their preferred payment method than change how they pay.

In other words, payment method choice is the primary factor in their decision, and the e-commerce platform they shop at become less important when they cannot use their preferred payment option. These patterns vary across Member States. When looking at countries that deviate from the average, respondents in Austria (84%), the Netherlands (79%), and Portugal (80%) show a stronger tendency to stick to familiar payment methods, while respondents in Czech Republic (67%), Italy (67%), Latvia (67%), and Poland (64%) exhibit greater flexibility, as shown in the graph below.

**Figure 2.21: Resistance to change in payment behaviour**

G5. In your opinion, which of the following statements are true or false? 'If an online shop does not offer a payment method I own, I would rather go to a different shop than set up a new payment method' (% True) (N=11532)



Source: Consumer survey

Based on the two survey questions in the figures above (H7 and G5), in some of the countries with a higher share of respondents trusting consumer protection measures, i.e., Spain (5.6) and Italy (5.6), there is also a lower share of respondents reluctant to set up a new payment method. This could suggest a degree of flexibility among consumers in these Member States. However, an alternative explanation could be the relatively low number of payment methods owned in Spain and Italy, which may make consumers more inclined to register for a new payment method. This could indicate that, rather than resistance, there is simply less familiarity or fewer options to begin with, making the adoption of a new payment method more attractive.

When examining other factors which may explain these differences for reluctance to set-up a new payment method, such as attitudes towards novelties and trust in payment method security, the findings reveal that this pattern is not consistent across all countries. In some cases, even when trust in payment methods and consumer protection is high, respondents prefer switch e-commerce platforms rather than set up a new payment method.

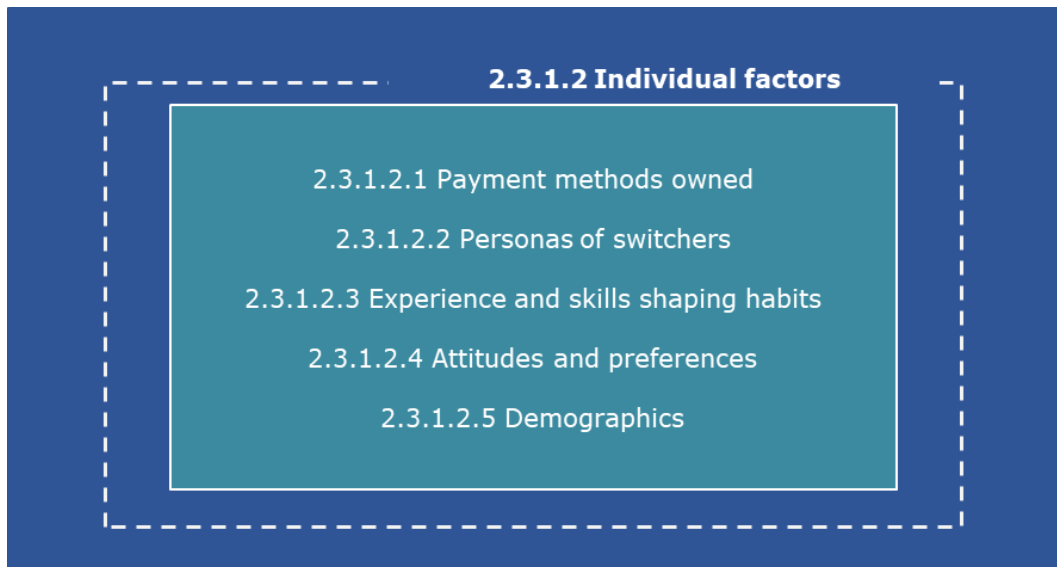
This suggests that multiple factors influence consumers' willingness to adopt a new payment method, beyond just trust in consumer protection. While higher trust levels in some countries may be associated with greater flexibility, this relationship does not hold universally. Other variables, such as familiarity with payment options, personal habits, and perceived ease of use, likely play a role in shaping these decisions. However, due to the scope of the survey, not all potential influencing factors were examined, making it difficult to draw a definitive analytical conclusion about what drives these differences. Further research would be necessary to explore the full range of factors affecting consumer behaviour in payment method selection.

Instead, the data indicates a clear preference for switching to a different online store over adopting a new payment method, underscoring the importance of payment method availability in shaping consumer decisions.

Consistently with the literature, these findings reinforce that both social norms and personal beliefs are external actors shaping consumer behaviour in online shopping.

### 2.3.1.2. Individual factors

**Figure 2.22: Individual factors**



*Source: Project Team elaboration*

Individual factors indirectly influence payment method decisions by shaping how people assess and engage with different payment options. Rooted in a person's experiences, skills, attitudes and preferences, these factors help determine how different payment options are perceived and evaluated before a purchase takes place. While they act at the individual level, they interact with external factors and contribute to the broader decision-making context.

### 2.3.1.2.1. Payment methods owned

#### Key take-aways

- Younger age groups tend to own more payment options than older age groups. With difficulty paying bills, the trend is less clear as in some member states those with greater difficulties have more payment methods, and in some MSs this is the opposite.
- The most common payment method by member states is either credit or debit card, bank transfer, Paypal, or in some instances, schemes different than ICS available in one or a group of MSs. This does not always translate to frequency of use as the latter tend to outpace digital wallets and other formats.
- Big Tech wallets (Google Pay and Apple Pay) are among the most frequently used payment methods in half of the Member States, despite not being part of the most popular options in any of them. This indicates a mismatch between the ownership and usage of this payment method.
- Mastercard and Visa are the most owned credit or debit cards and largely outnumber other card schemes in terms of ownership. While some non-ICS schemes that are only available in one or a group of MSs are rather popular, they are largely eclipsed by international brands.
- Alternative payment methods do not have large scale adoption in the sample, but some options are used more than others, such as payment on delivery, direct debit and payment by invoice.

This section presents the main survey data regarding the payment methods owned by participants.

The consumer survey and behavioural experiment included both universal payment methods which are generally available in all countries, and locally available options, whose availability is limited to a certain country or a restricted group of countries. The first types of methods comprehended international (credit or debit) cards, Paypal, Big Tech wallets, online banking and methods based on online banking, whereas among local options were card schemes different than ICS available in one or a group of MSs, online banking and methods based on online banking, "Buy Now Pay Later" and "pay in instalments" platforms, and other digital wallets.

With regard to non-ICS card schemes that are only available in one or a group of countries, it should be noticed that some respondents indicated owning card schemes from other Member States.

During the mystery shopping exercise, we have observed that local payment methods (including card schemes) from certain countries are also available in other MSs: for instance, Przelewy24 - which is Polish – was made available on some German and Austrian platforms, or Bancontact - which is a Belgian card scheme – also made available on some platforms in the Netherlands. Such multi-country availability does not indicate that these methods or schemes are in fact domestic in all the countries in which they are available, but simply that certain platforms choose to offer them as a payment method in other countries in addition to the ones from which they originate.

It is important to notice that the survey results on ownership of card schemes different than ICS available in one or a group of MSs should be taken with caution for different reasons. First, some survey replies pointing to misreporting have been identified, which suggests that consumers may not have a clear understanding of what a card scheme is. While clearly wrong results have been removed, this also raises questions on the reliability of responses concerning the remaining schemes and requires caution in the

interpretation of the data. In addition, it is likely that the actual usage of card schemes different than ICS for online payments may be more limited compared to the levels of ownership indicated by survey respondents. In fact, many respondents with co-badged cards (i.e., cards operating on both an international and a local scheme) might not have known that for online payment they can only use the international scheme. These limitations apply to any section, table, graph or visual regarding cards different than ICS.

The survey data provided a picture of payment method ownership and usage in the selected 14 Member States.

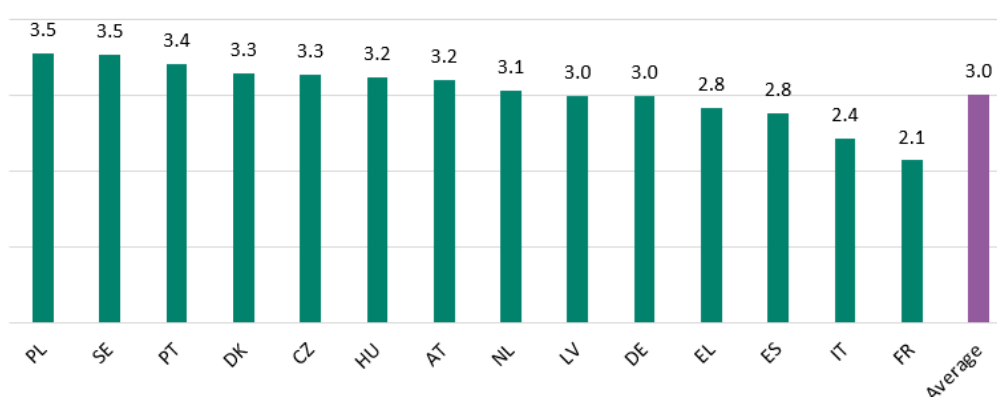
### Payment method ownership

Payment method ownership was measured through the consumer survey with the share of respondents who declared having and having used a determinate payment method for their online purchases in the past. Overall, the data depicted a rather homogeneous landscape. Accordingly, there were no substantial differences between the analysed countries regarding the number of payment options owned for online purchases per individual. As shown in the graph below, in all Member States, participants owned on average more than one payment option, with an average of 3 payment methods per individual. The lowest average number of options per individual were displayed in France (2.1) and Italy (2.4) whereas the highest were registered in Poland and Sweden (3.5).

Although a clear pattern was not observed, all countries located in central Europe (AT, CZ, HU, PL) had values above average (between 3.2 and 3.5), whereas in Southern European countries (EL, ES, IT) respondents owned on average less payment options compared to the average, with the exception of Portugal.

**Figure 2.23: Average number of different payment method owned per respondent by country**

E5. Which of the following payment methods do you have and have used to make online purchases? (N=11532)



Source: Consumer survey

The data collected suggested a positive correlation between online payment frequency and the quantity of payment methods owned for online purchases. In fact, most options were owned in higher percentages by participants who declared purchasing online once or multiple times a week. Consistently, those who did so less than once a month declared having and using on average less payment methods.

A deeper look into respondents' characteristics revealed that, overall, older respondents with low levels of digital literacy owned a more limited array of payment options for their online purchases compared to the rest of the sample.

Table 2.6 below shows that participants having and using the most payment options for their online purchases were in the 25-39 age bracket in all countries except Denmark, where the band which had more methods was the 40-54 one. Only in the Netherlands and Poland participants aged between 18 and 24 owned on average the same number of options as the respondents in the 25-29 group. As this age group bracket tends to have and use more payment options to choose for purchases, they might be more exposed to the effects of display practices that aim to influence them to change payment option. On the other hand, in most countries, older respondents (especially those aged 65+) owned the least payment methods. Older age brackets with fewer options and a greater tendency to refrain from using new payment methods, may more easily abandon purchases rather than choosing an option they do not have, compared to younger cohorts with more payment options. Hungary, Latvia, and Sweden represented an exception, where a limited choice was registered among younger participants (18-24). Overall, variation between age bands was limited but noticeable. Greece, France, and Portugal showcased the highest levels of variation, with a difference of 1.1 payment method between the most and least equipped. The variation was also noticeable in Germany (1). Conversely, less variability was observed in Austria (0.6), Hungary, Latvia, the Netherlands, and Poland (0.7).

**Table 2.6: Average number of payment methods owned by Member State and age**

Country	18-24	25-39	40-54	55-64	65+	Total
AT	3.2	3.6	3.2	3.0	3.1	3.2
CZ	3.1	3.8	3.6	3.0	3.0	3.3
DE	3.1	3.6	3.1	2.8	2.6	3.0
DK	3.3	3.6	3.8	3.4	2.7	3.3
EL	3.3	3.4	3.0	2.8	2.3	2.8
ES	2.8	3.1	3.0	2.9	2.2	2.8
FR	2.6	2.8	2.2	1.8	1.7	2.1
HU	2.8	3.5	3.4	3.3	3.1	3.2
IT	2.6	2.9	2.8	2.3	2.0	2.4
LV	2.7	3.4	3.0	2.7	3.2	3.0
NL	3.4	3.4	3.0	3.0	2.7	3.1
PL	3.9	3.9	3.7	3.3	3.2	3.5
PT	3.6	3.9	3.6	3.5	2.8	3.4
SE	3.2	4.0	3.5	3.5	3.3	3.5

Source: Consumer survey

The consumer survey data also suggested a positive relationship between participants' degree of digital literacy and the number of payment options owned and used for online payments. Notably, respondents with lower digital literacy, declared having on average 2.8 payment methods for their online purchases, whereas on average those with higher digital skills have 3.6 payment options on average.

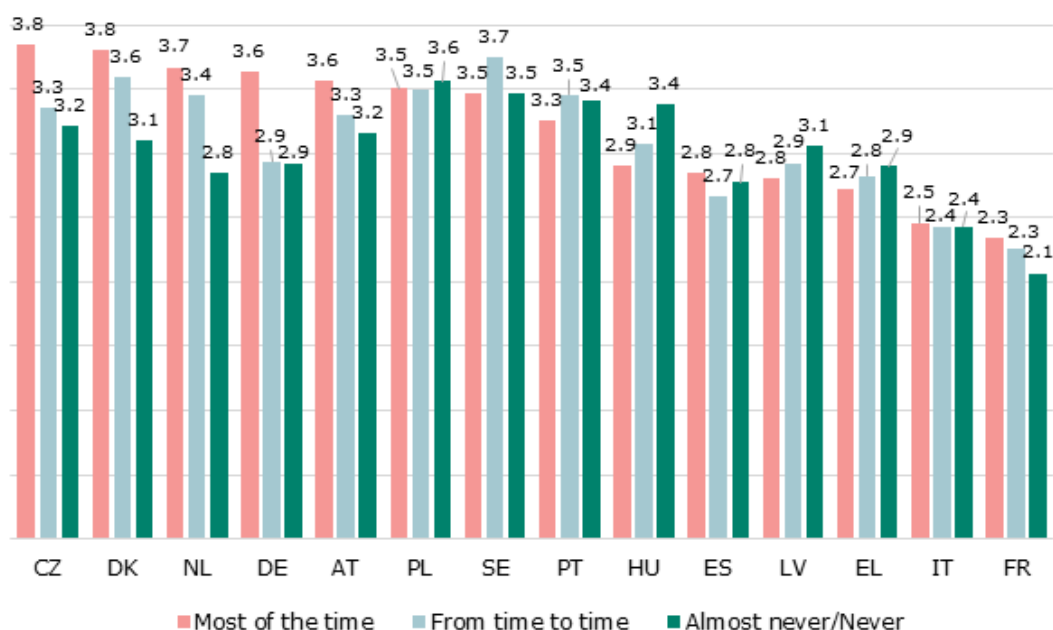
The graph below shows that in eight out of 14 Member States, participants that declared having the most financial difficulties had on average more payment methods compared to those with less. Despite this, limited variation was observed between levels of financial difficulties in most countries. Indeed, differences were more noticeable in Germany, Denmark, Hungary, and the Netherlands, and less prominent in Italy, Latvia, Poland and Portugal. These trends on financial difficulties were also investigated based on age. The number of payment methods owned and used for online purchases was the greatest for those who answered having difficulties paying bills almost never or never for age brackets 18-24, 25-39, and 55-64. For the age groups 40-54 and 55-64, those

who answered most of the time and from time to time, respectively, had and used the greatest number of payment methods.

**Figure 2.24: Number of payment methods owned by Member State and difficulty paying bills (mean)**

E5. Which of the following payment methods do you have and have used to make online purchases?

H4. During the last twelve months, would you say you had difficulties paying your bills at the end of the month? (N=11351)



Source: Consumer survey

Note: the value considers the mean number of payment methods owned as identified in E5: Which of the following payment methods do you have and have used to make online purchases?, by Member State and difficulty paying bills

Table 2.7 depicts the top 3 payment methods in each Member State. Overall, Paypal and credit or debit cards were most popular across all considered countries and regions. The first was owned and by 65% of all respondents and was among the top 3 most popular options in 13 out of 14 countries. Similarly credit or debit cards were part of top 3 in 12 countries and available to 64% of the sample, while bank transfer represented a payment option for 45% of survey participants and was part of the 3 most widespread methods in 7 countries. On the other hand, the diffusion of local payment options seemed more context-dependent but still fairly popular, with higher presence in over half of the Member States. The table below shows that local payment methods were among the most popular in nearly half of the countries, although universally available options such as credit or debit cards or Paypal were often the most widely used method. Specifically, these locally available options were among the top 3 payment methods in 8 countries and particularly widespread in Sweden, where 2 out of the 3 top payment methods were local ones. The relevance of local options was also clear in the analysis of the popularity of wallets, presented below in Figure 2.27 and Figure 2.28.

Table 2.7: Top 3 most popular\* payment methods per Member State

Rank	AT	CZ	DE	DK	EL	ES	FR	HU	IT	LV	NL	PL	PT	SE
1	Credit or debit card	Bank transfer	Paypal	MobilePay	Credit or debit card	Credit or debit card	Credit or debit card	Paypal	Paypal	Swedbank	iDEAL (wero)	BLIK	Credit or debit card	Swish
	74%	66%	88%	78%	81%	79%	73%	68%	77%	53%	97%	70%	85%	75%
2	Paypal	Credit or debit card	Bank transfer	Credit or debit card	Paypal	Paypal	Paypal	Bank transfer	Credit or debit card	Paypal	Paypal	Bank transfer	MB Way	Credit or debit card
	72%	65%	61%	75%	69%	77%	66%	61%	74%	51%	54%	64%	66%	65%
3	Bank transfer	Paypal	Credit or debit card	Paypal	IRIS	Bizum	Bank transfer	Credit or debit card	Bank transfer	Credit or debit card	Klarna	Paypal	Paypal	Klarna
	66%	55%	49%	58%	36%	53%	22%	57%	31%	51%	34%	62%	61%	65%
<b>N=11532</b>														

Source: Consumer survey

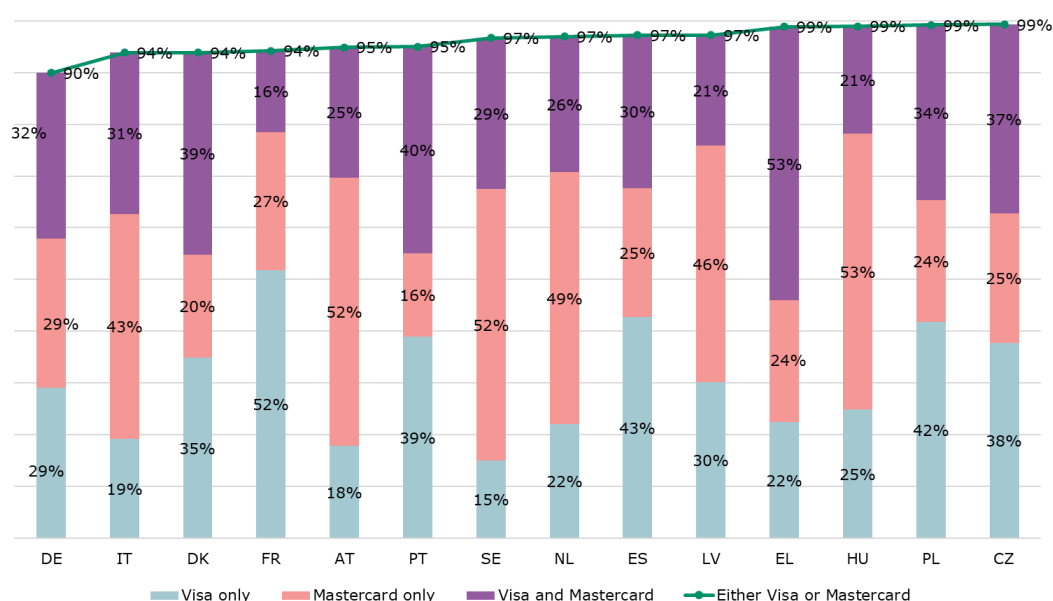
Note: \*Popularity is represented by the share of respondents who declared owning and using for online purchases each payment method (E5: Which of the following payment methods do you have and have used to make online purchases?)

Within credit or debit cards and ICS in general, Mastercard and Visa were the prevalent card schemes both being owned by over half of respondents in most countries – respectively, 13 for Mastercard and 9 for Visa. As shown in the below figure, 35% of the sample declared owning only Mastercard and 31% only Visa. Almost the entirety (96%) of respondents who declared owning a credit or debit card either own Visa or Mastercard, whereas 31% of respondents declared owning both.

Other international card schemes had a comparatively marginal diffusion: 5% of the sample owned American Express, and 1% or less owned Diners Club, Discover, and JCB.

**Figure 2.25: Top 2 most popular international card schemes**

E6. You've indicated owning a credit and/or debit card. Please specify which of the following credit or debit card you own. (N=7393)



Source: Consumer survey<sup>121</sup>

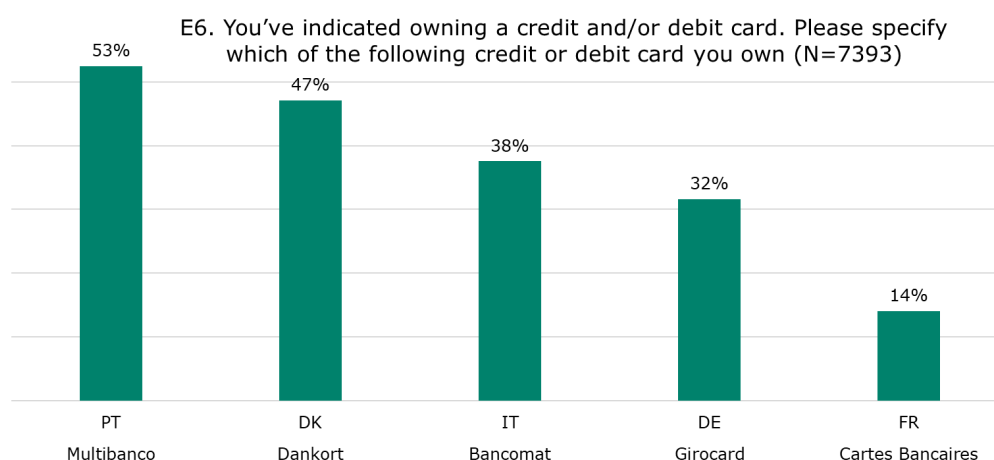
In all countries where card schemes different than ICS are available, these represented the third most popular type of credit or debit card owned with the exception of the Netherlands and Sweden, where the third most common scheme was American Express. Nonetheless, diffusion varied largely among countries. The graph below shows that a considerable share of participants (between 32 and 53%) in Austria, Germany, Denmark, Italy, and Portugal declared owning cards different than ICS. Yet, in other contexts their popularity was more limited. This was the case of France, where popularity ranged between 12 and 17%, and most noticeably of Spain, Sweden, and the Netherlands, where respectively 6%, 4%, and 2% of respondents owned a card different than ICS.

<sup>121</sup> The "Visa only" and "Mastercard only" categories do not exclude ownership of other card schemes. That is to say that one may own any number of card schemes to qualify to for example the "Visa only" category, as long as they do not own a Mastercard, at which point they qualify for the "Visa and Mastercard" category.

The data collected on card schemes (see Figure 2.26) is linked to question E5, which asks to indicate the payment methods owned and used for online payments.<sup>122</sup> As stated at the beginning of this section, the reliability of the presented data should be taken with caution, due to identified misreporting (related answers have been removed). Also, in a limited number of countries with domestic schemes, respondents with co-badged cards (i.e., cards operating on both an international and non-ICS scheme) might not have known that for online payment they can only use the international scheme.

In addition, it should be noticed that no card schemes different than ICS are available in Austria, Czechia, Greece, Hungary, Latvia, the Netherlands Poland, Spain, and Sweden.

**Figure 2.26: Popularity card schemes different than ICS per Member State**



Source: Consumer survey

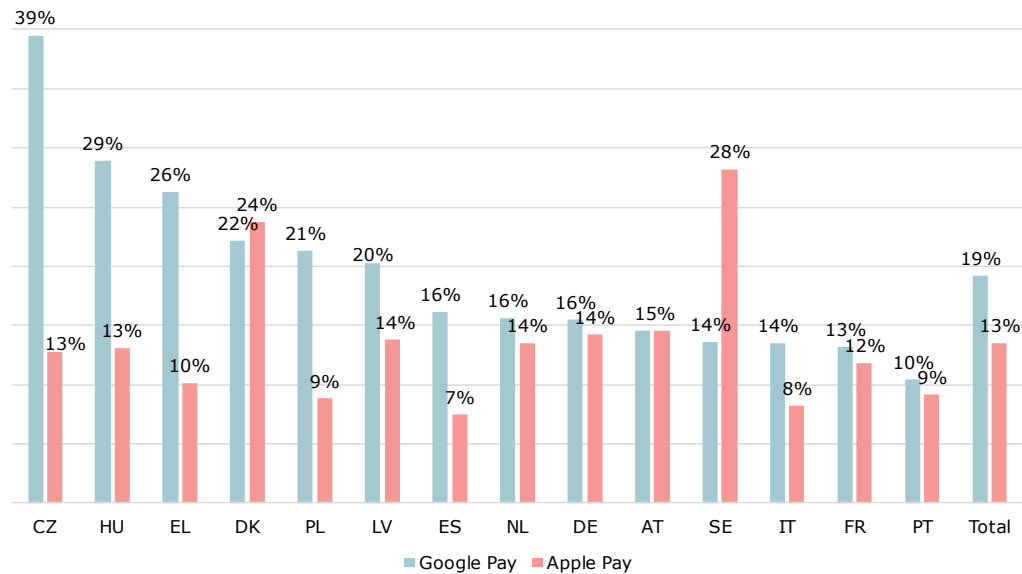
As the two graphs below show, overall wallets had limited diffusion among respondents with differences between Big Tech wallets and other, locally available ones. With regards to the first group, Google Pay and Apple Pay were owned by less than one fifth of the sample (respectively, 19% and 13%) and were not among the most common payment methods in any country. Both presented some degree of variation in terms of diffusion across Member States. Notably, Google Pay was least common in Portugal, where only 10% of respondents declared owning it and more popular in Czechia and Hungary, where respectively 39 and 29% of participants owned it. Similarly, Apple Pay was rather unpopular in Spain (7%), whereas it was available to respectively 28 and 24% of respondents from Sweden and Denmark. Concerning their popularity, some regional variations were observed. Although not always, Google Pay was visibly predominant mainly in central and southern European countries (CZ, HU, PL, EL, ES, IT) whereas ownership was similar in some western European countries, i.e., the Netherlands, Germany, Austria, France, and Portugal. Conversely, Apple Pay was more diffused than Google Pay in the two Scandinavian countries, Denmark and Sweden. Nonetheless, as will be explained more in detail towards the end of the frequency sub-section, Figure

<sup>122</sup> The exact wording of the question is: "E5. Which of the following payment methods do you have and have used to make online purchases?"

2.30 shows that there was a noticeable mismatch between ownership and frequency of use, the latter being rather high for Big Tech wallets.

**Figure 2.27: Ownership of Big Tech wallets per Member State**

E5: Which of the following payment methods do you have and have used to make online purchases? (N=11532)

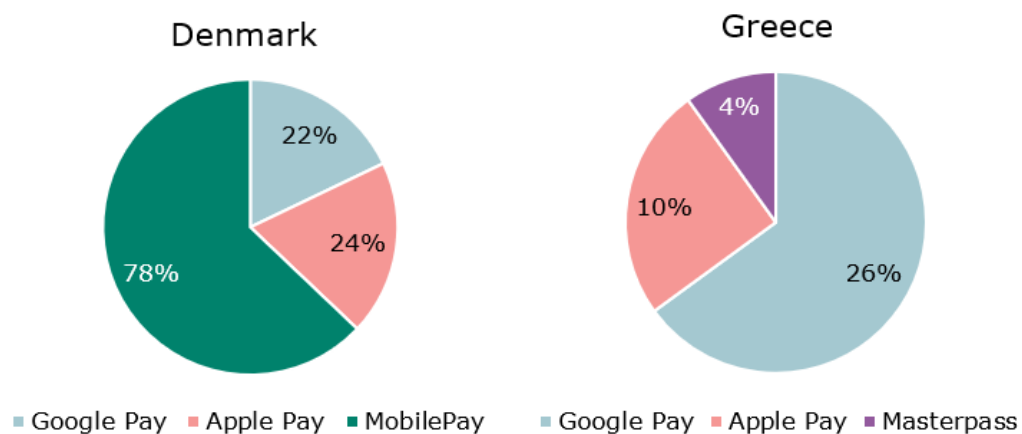


Source: Consumer survey

Concerning the second group, the two locally available wallets presented great variation in terms of ownership. The figure below illustrates the relative popularity of wallets in Denmark and Greece, where other types of wallets are used. As visible, in Denmark 78% of respondents declared owning Mobile Pay which was also the first most popular option (see Table 2.7), whereas Masterpass was very scarcely present in Greece, owned by only 4% of respondents.

**Figure 2.28: Ownership of other wallets compared to Big Tech wallets**

E5: Which of the following payment methods do you have and have used to make online purchases? (N=800 [DK]; N=800 [EL])



Source: Consumer survey

### Frequency of use of owned payment methods

The overall survey responses revealed that, despite the varying degrees of popularity of the payment methods among participants, their frequency of usage appeared more homogenous. Figure 2.30 below depicts the frequency of use (in percentage) and general ownership and use of payment methods in each country.<sup>123</sup>

Frequency of usage was defined based on the replies to question “E5a. You mentioned you own the following payment methods. Please indicate how frequently you use each method, whose response options were placed on a Likert scale of 1 to 5, where 1 means ‘almost never’, 2 means ‘rarely’, 3 means ‘occasionally’, 4 means ‘frequently’ and 5 means ‘almost always’”. In particular, throughout the report we consider that respondents frequently use a payment method if they have selected option 4 or 5 for that payment method in the above question.

As shown in Figure 2.30, not in all cases the most popular option was also the most frequently used. Indeed, the most common options tended to showcase medium-high frequencies of use, but this was often the case for several uncommon options. In some cases – for instance, Hungary and Portugal – the least diffused methods were used more often by their owners compared to the popular ones.

Some revealing insights also emerged when looking at the share of respondents who reported always using a payment method. Some more interesting results do appear here regarding the comparison between ownership and frequency of use. Indeed, while credit and debit cards, Paypal, and domestic options like BLIK all tended to have an ownership of around 60-70%, the frequency of use varied greatly. 40% of BLIK owners mentioned using it always, whereas for credit and debit cards, this was at 30% and dropped down to 15% of Paypal users. This indicates that while Paypal had large adoption across the market through its accessibility, it presented an average frequency of use (around 3.3 where 3 indicated “occasionally” and 4 indicated “frequently”) and only small minority of users declared using it almost always. This may explain why its share of e-commerce purchases and value was significantly lower than its usership.

Across countries, only a limited share of survey participants indicated utilising the payment methods they own very rarely. In fact, some options with very limited diffusion – Bancontact, a card scheme different than ICS available in the Netherlands<sup>124</sup>, and EPS, an online banking-based method available in Austria – registered a frequency of usage of 2.8.

The analysis of frequency of use confirmed the dominance of credit or debit cards, which were among both the most popular and most frequently used in 13 countries, ranking first in 6 of them. On the other hand, as discussed above Paypal was dominant in terms of ownership but was among the most frequently used options only in 5 countries – ranking first in Germany.

In addition, Figure 2.30 shows that domestic options excluding card schemes different from ICS were among the most frequently used payment methods in half of the Member States, namely Denmark, Hungary, Latvia, the Netherlands (if considering iDEAL, now

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<sup>123</sup> To see how the mean frequency of use has been used for the comparison, please see the description under Figure 2.30.

<sup>124</sup> While Bancontact is available in the Netherlands, it is a Belgian card circuit.

absorbed by Wero), Poland, Portugal and Sweden<sup>125</sup>. Notably, local options seemed especially relevant in Sweden, where 2 of the 3 most popular and most frequently used methods were locally available ones. In addition, local options had presented a relatively high frequency of use also in Czechia, Greece, and Italy.

The data collected on frequency of use also offers some insights on wallets, indicating a mismatch between the ownership and frequency of use of Big Tech wallets. Both Google Pay and Apple Pay presented above average mean frequency scores (respectively, 3.4 and 3.7), and were part of the most frequently used payment methods in 11 Member States, namely Austria, Czechia, Germany, Denmark, Greece, Spain, France, Hungary, Italy Latvia, and the Netherlands<sup>126</sup> despite not being part of the most popular options in any of them (see the figure below). Notably, Apple Pay was part of the top three considerably more often than Google Pay.

The following graph presents the overall ownership and their subsequent frequency of use when owned of payment method clusters across all countries. In order to have a more holistic understanding of frequency in the below graph, we use a slightly different definition for frequency as the normalised average when asked about frequency of payment method use in online purchases. Note that while payment method ownership considers the base population as all respondents, payment method frequency considers the base population as those who own the payment method.

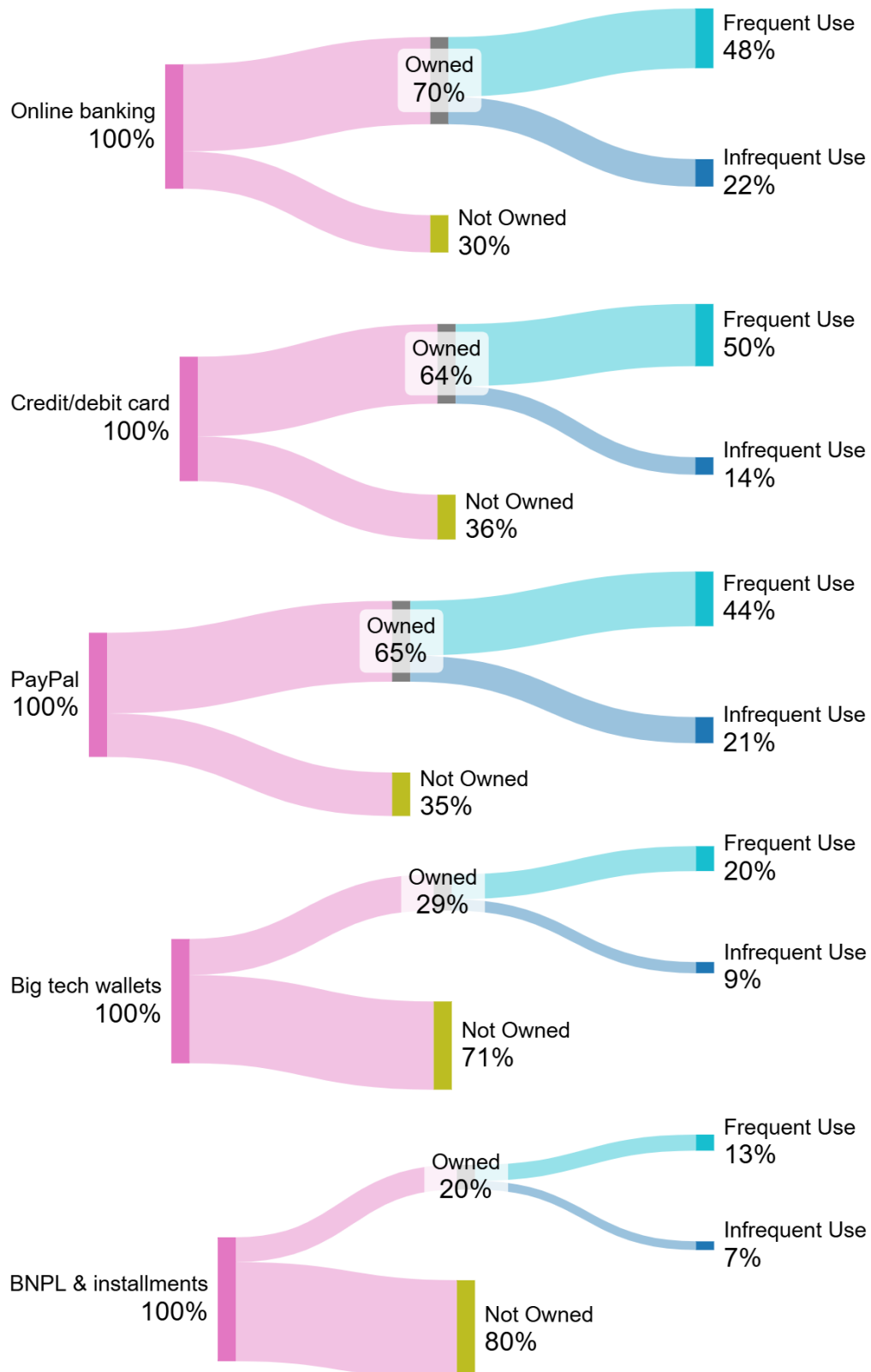
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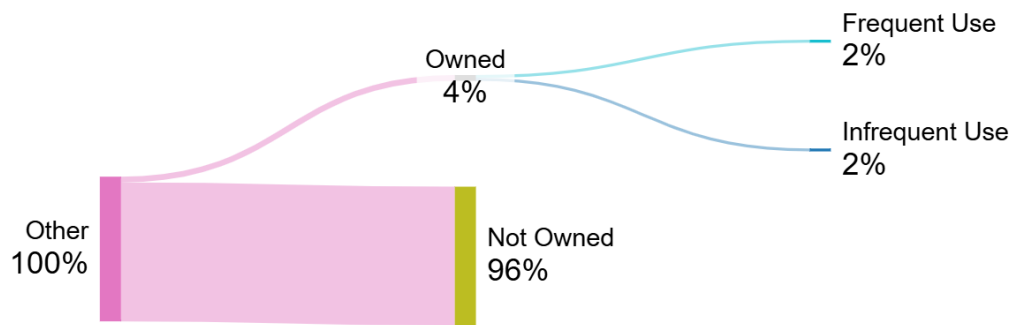
<sup>125</sup> The figure excludes all payment methods owned by less than 10% of respondents. When considering all payment methods, domestic options still rank higher in terms of frequency of use, being at the top in 8 countries (AT, DE, DK, HU, LV, PL, PT, SE) and covering the first place in Austria (Przelewy24), Latvia (Swedbank), and Poland (BLIK).

<sup>126</sup> Considers only payment methods owned by at least 10% of respondents. When considering all payment methods, wallets were among the most frequently used payment methods in Czechia, Germany, Greece, Spain, France, the Netherlands, and Poland.

**Figure 2.29: Payment method ownership\* and frequency of use\*\* of payment method clusters across countries**

Ownership and frequency of use of payment methods (N=11532 )





Source: Consumer Survey

Note: \*Ownership is defined based on whether respondents have and have used a payment method in the past according to the wording of question E5. With regards to 'Online banking & methods based on online banking', this cluster includes Bankgirot, a Swedish domestic option. In the Swedish sample it should be noted that only respondents who declared owning a credit or debit card (65%) could also indicate owning Bankgirot (9%), thus the real diffusion of this payment method might be higher than reported in the survey.

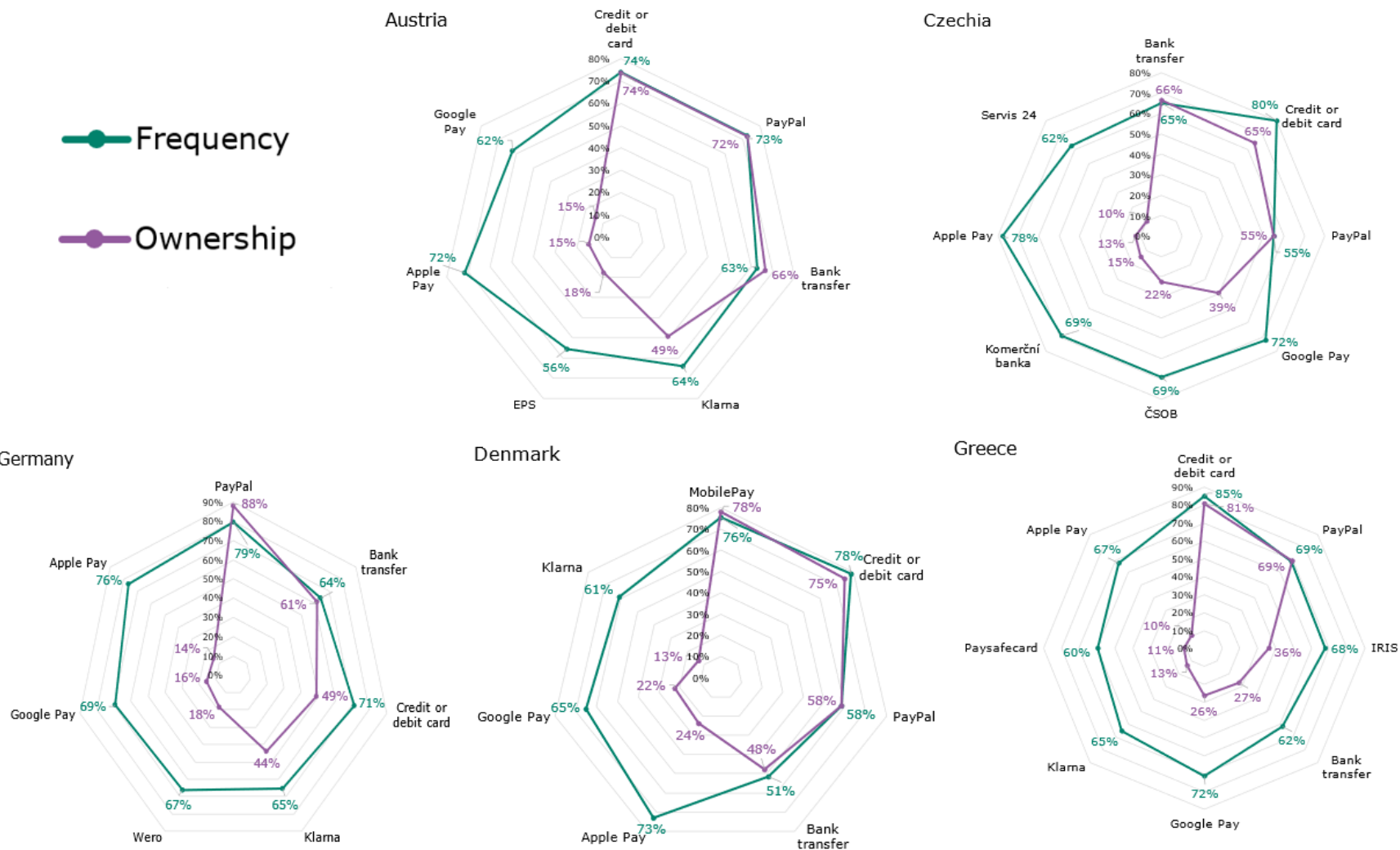
\*\* Frequency of use for the cluster 'Online banking & methods based on online banking' does not include data on the frequency of use of Bankgirot because of data unavailability. The share of respondents in the total sample who indicated owning this payment method is close to 0%.

The values presented have been derived from clustering each payment method in thematic categories. The payment method clusters were ordered from largest to smallest based on their ownership rate.

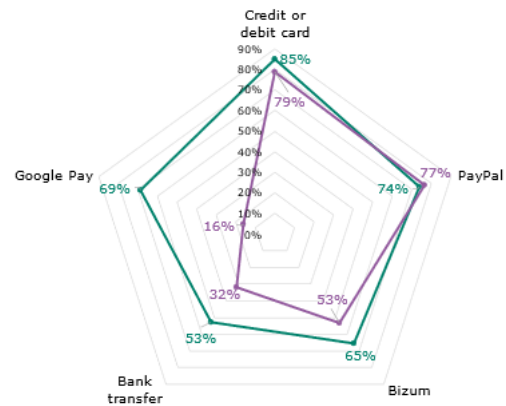
Frequency here has been calculated differently and is based on the average mean answers to question E5a of the payment methods present in each cluster. To transform the mean values into percentages, the average mean values were put in proportion to the maximum value, 5, which corresponded to 100%; this was achieved by dividing each mean value by 5 and multiplying it by 100. This was then taken out of the total share of those who owned the payment method.

For ownership, the team used the average responses to question E5 of the payment methods in each cluster.

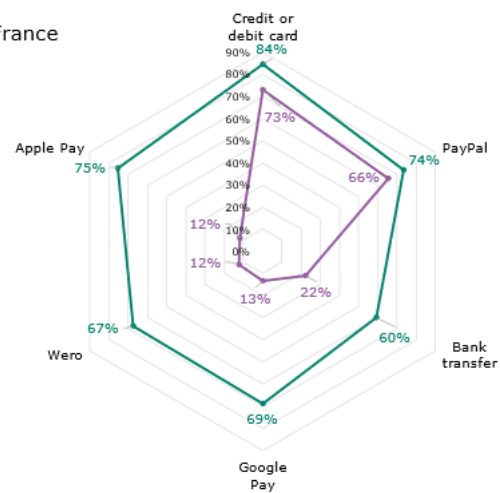
Figure 2.30: Payment method ownership and frequency of use\* per Member State (%)



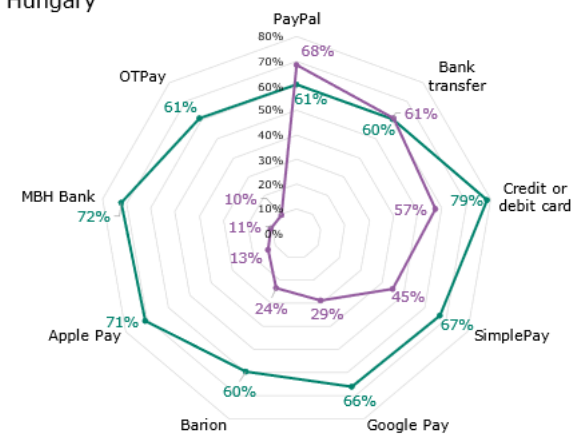
Spain



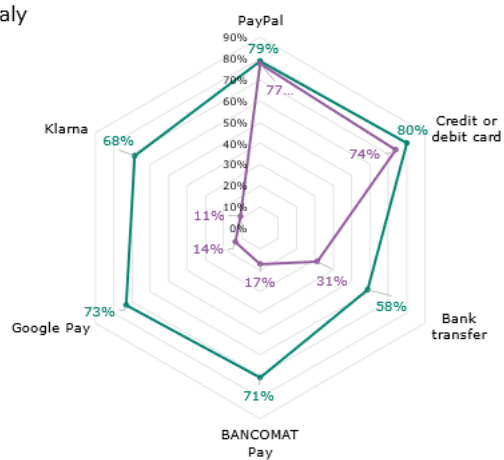
France



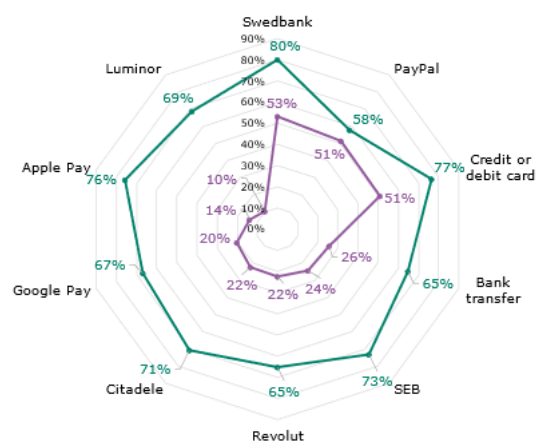
Hungary



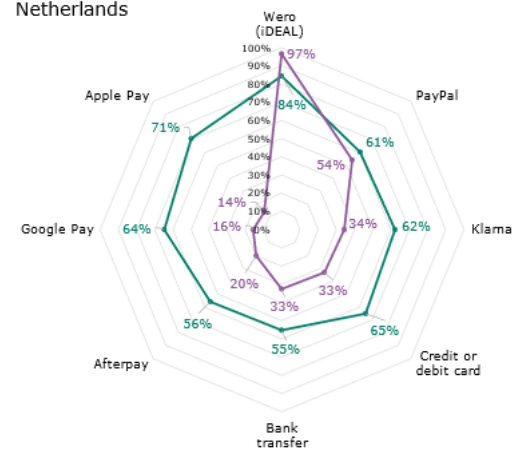
Italy



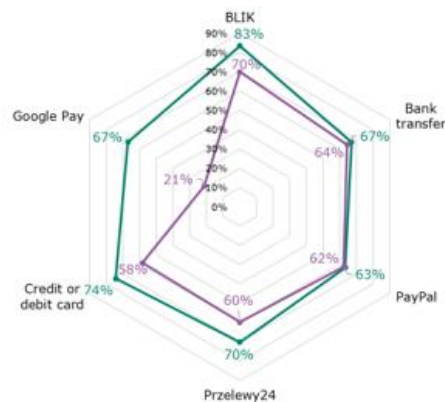
Latvia



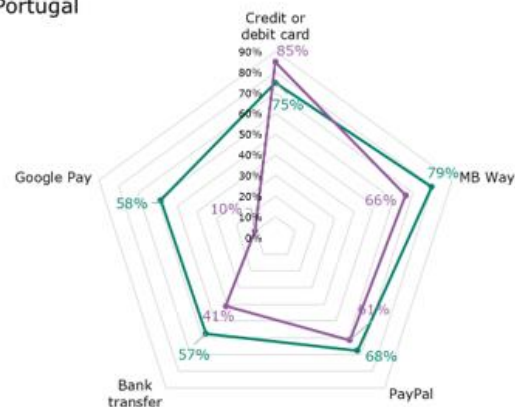
Netherlands



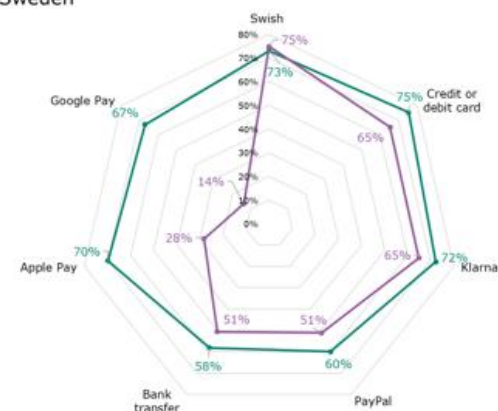
Poland



Portugal



Sweden



Source: Consumer survey

Note: N=835 (AT); N=800 (CZ); N=847 (DE); N=800 (DK); N=800 (EL); N=851 (ES); N=850 (FR); N=800 (HU); N=851 (IT); N=799 (LV); N=848 (NL); N=800 (PL); N=851 (PT); N=800 (SE);

\* Frequency was calculated based on the mean answers to question E5a. You mentioned you own the following payment methods. Please indicate how frequently you use each method, whose response options were placed on a Likert scale of 1 to 5, where 1 means "almost never", 2 means "rarely", 3 means "occasionally", 4 means "frequently" and 5 means "almost always". To transform the mean values into percentages, each mean value was put in proportion to the maximum value, 5, which corresponded to 100%; this was achieved by dividing each mean value by 5 and multiplying it by 100. For ownership, the team used the responses to question E5. Which of the following payment methods do you have and have used to make online purchases?

For each Country, the payment methods were ordered from largest to smallest based on their ownership rate. Only the payment methods owned by at least 10% of respondents in were included in the graphs.

With regards to schemes different than ICS, data on frequency of use was collected for credit or debit cards without distinguishing between international and other, locally available schemes. Specific data on these schemes is thus unavailable, but it is possible to make some inferences when considering at once the popularity and frequency of use of credit and debit cards and the ownership of non-ICS schemes. In fact, it is possible to logically assume that they might be used with a certain frequency in Portugal, Italy, Denmark, Germany and Austria. As shown in Table 2.8, these countries which showcased at once (i) high diffusion of locally available cards different than ICS (i.e., owned by more than ¼ of card owners), (ii), high levels of ownership of credit or debit cards (payment method is among the top 3 most popular in the country), and (iii) above average frequency of use of credit or debit cards (on a scale of 1 to 5, the mean frequency is above 3). Also in this case, the reader is invited to keep in mind the considerations on the reliability of data regarding card schemes different from ICS made at the beginning of the section, and especially to consider that some respondents might not have known that co-badged cards can only operate on the international scheme when purchasing online, thus their perception and real usage might differ.

**Table 2.8: popularity of credit and debit cards, mean frequency of use, and ownership of cards different than ICS per Member State**

MS	Popularity of credit/debit cards (rank)	Mean frequency of use of credit/debit cards	Ownership rate of cards different than ICS available in a MS or group of MSs
AT	1st	3.7	39%
CZ	2nd	4	No domestic scheme
DE	3rd	3.5	32%
DK	2nd	3.9	47%
EL	1st	4.2	No domestic scheme
ES	1st	4.2	6%
FR	1st	4.2	14%
HU	3rd	3.9	No domestic scheme
IT	2nd	4	38%
LV	3rd	3.8	No domestic scheme
NL	Not in top 3	3.3	17%
PL	Not in top 3	3.7	No domestic scheme
PT	3rd	3.7	53%
SE	2nd	3.8	12%

Source: Consumer survey

Note: this table showcases for each Member State the following: (i) popularity of credit and debit cards compared to other payment methods, (ii) mean frequency of use on a scale from 1 to 5, where 1 means "almost never", 2 means "rarely", 3 means "occasionally", 4 means "frequently" and 5 means "almost always", and (iii) ownership of non-ICS cards measured as the share of credit and debit card owners who have one or cards different than ICS.

### Alternative means of payment

In general, the popularity and usage of alternative means of payment was rather limited among survey respondents. Payment on delivery, direct debit and payment by invoice

were more popular, whereas “buy now, pay later” solutions, payment by instalments, and above all cryptocurrencies had very poor diffusion.

Alternative payment methods were more popular among respondents who purchase online often. Although variability was not pronounced, the data showcased a clear trend according to which the more frequently respondents had purchased online, the more frequently they used each option. The following table shows the mean frequency of use of each alternative.

**Table 2.9: Mean frequency of use of alternative payment methods by the overall frequency of online payments**

Overall frequency of use of alternative means of payment	Cash/card on Delivery (N=11532)	Buy now pay later (N=11532)	Instalments (N=11532)	Gift cards (N=11532)	Cryptocurrency (N=11532)	Direct debit (N=11532)	Pay by invoice (N=5665)
Less than once a month	2.5	1.6	1.6	2.1	1.2	2.3	2.3
Approximately once a month	2.4	1.8	1.7	2.2	1.2	2.4	2.4
2-3 times a month	2.4	1.9	1.8	2.3	1.3	2.5	2.5
Once a week	2.5	2.2	2.0	2.5	1.6	2.7	2.7
More than once a week	2.9	2.5	2.4	2.8	1.9	2.9	2.9

Source: Consumer survey

*Note: The labels on the y-axis correspond to the overall frequency of online payments as determined by E4: On average, how frequently did you make online purchases in the last year with a payment method under your name? The labels on the x-axis correspond to the frequency of use of alternative payment methods as determined by E7: How often do you use the following alternative types of payment methods? The values are based on E7 on scale from 1 to 5, where 1 meant less than once a month and 5 meant more than once a week.*

The analysis of participants’ profiles also revealed that the employment of alternative payment methods decreased with age, as younger respondents tended to make more frequent use of these options. In particular, those aged between 25 and 39 declared using each alternative more often compared to other age bands, with the only exception of payment on delivery which was more popular in the 18-24 band. This result is consistent with the finding that participants aged 25-39 generally owned more payment methods compared to the rest of the sample. On a similar note, as shown in the table above respondents aged 65+ where the ones choosing each option least frequently in 6 out of 7 options. No similar distinctions were observed based on gender, where the distribution of answers was homogenous.

As depicted in the below table, survey data showed that all alternative methods were used more often by respondents with lower income, although with low variation between financial situations. Interestingly, the “Buy Now Pay Later” option was not used particularly frequently.

**Table 2.10: Mean frequency of use of alternative payment methods by financial situation**

Difficulty paying bills	Cash/card on delivery (N=11532)	Buy now pay later (N=11532)	Instalments (N=11532)	Gift cards (N=11532)	Cryptocurrency (N=11532)	Direct debit (N=11532)	Pay by invoice (N=5665)
Most of the time	2.9	2.5	2.4	2.6	1.9	2.9	2.9
From time to time	2.7	2.2	2.1	2.3	1.5	2.7	2.7
Almost never/Never	2.4	1.8	1.6	2.3	1.3	2.4	2.4

Source: Consumer survey

Note: Based on respondents' answers to question H4 - During the last twelve months, would you say you had difficulties paying your bills at the end of the month?

Although there were no noteworthy differences in terms of participants' education attainment, there was also a tendency for respondents with high digital skills to use each of the alternative means of payment more often compared to the rest of the sample. Similarly to the trend observed for those who declared purchasing online more than once a week, the frequency of use of these options diminished as together with participants' digital skills levels. Across age levels, in all age brackets, those who had difficulty paying bills most of the time had the highest frequency of use of alternative payment methods, and those who had difficulty paying bills almost never or never had the lowest frequency of use.

Lastly, some slight country-related differences in the use of alternative payment methods were also detected. "Buy Now Pay Later" payment solutions were used more frequently by respondents from Sweden. On a scale from 1 to 5 where 1 meant never and 5 meant always, "Buy Now Pay Later" had a frequency value of 2.7 in Sweden, against a mean value of 1.9. This finding was consistent with the popularity in the country of Klarna (see Table 2.7), a payment option which allows pay later. Other country differences included the higher popularity of instalments in France and Greece and the more frequent use of gift cards in Italy and the Netherlands. Similarly, "pay per invoice" resulted of more common usage in Czechia and Germany, although with low variations among countries. Similarly, there is consistency between Member States regarding the use of cryptocurrency, which is tendentially uncommon as online payment method everywhere.

#### 2.3.1.2.2. Personas of switchers

##### Key take-aways

- Five categories of online shoppers were created based only on **the number of owned payment methods** and their **frequency of use**.
- After defining the groups, key differences in preferences and attributes emerged between them: the frequency of online shopping, demographics, and several variables relating to skills, preferences, and attitudes.

To better understand and pinpoint functional, policy-relevant, categories of online shopping behaviours, by segmenting the survey data, we identified five distinct shopper personas. The definition of these segments (i.e., personas) considers only two variables:

- a. the number of payment methods owned by each respondent (survey question E5);
- b. the frequency of usage of these payment methods (survey question E5a).

For b), if the respondent selects a four or five (on a 5-point scale), which corresponds to “frequently” or “almost always”, that payment method is coded as being used often. As such, five distinct segments can be made.

**Table 2.11: Segment/persona definitions**

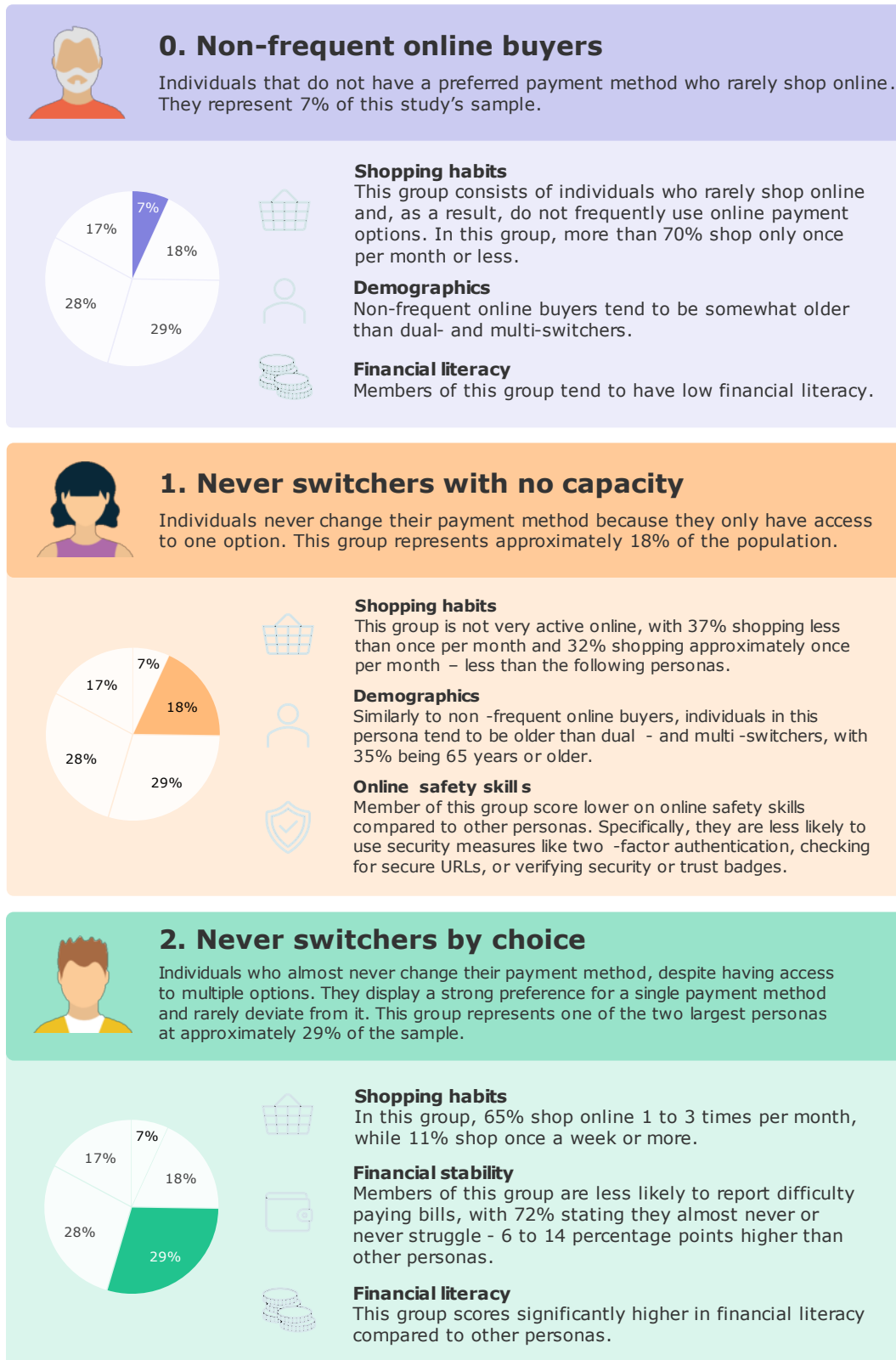
Persona	Definition	Proportion
<b>Never switchers with no capacity of switching</b>	Respondents who own <b>only one payment method</b> .	18%
<b>Never switchers by choice</b>	Respondents who own <b>more than 1 payment method, but use only one</b> frequently.	29%
<b>Dual switchers</b>	Respondents who own <b>more than 1 payment method and use two</b> frequently.	28%
<b>Multi switchers</b>	Respondents who own <b>more than 2 payment methods and use more than two</b> frequently.	17%
<b>Non frequent online buyers</b>	Individuals who <b>do not report using any payment method frequently</b> .	7%

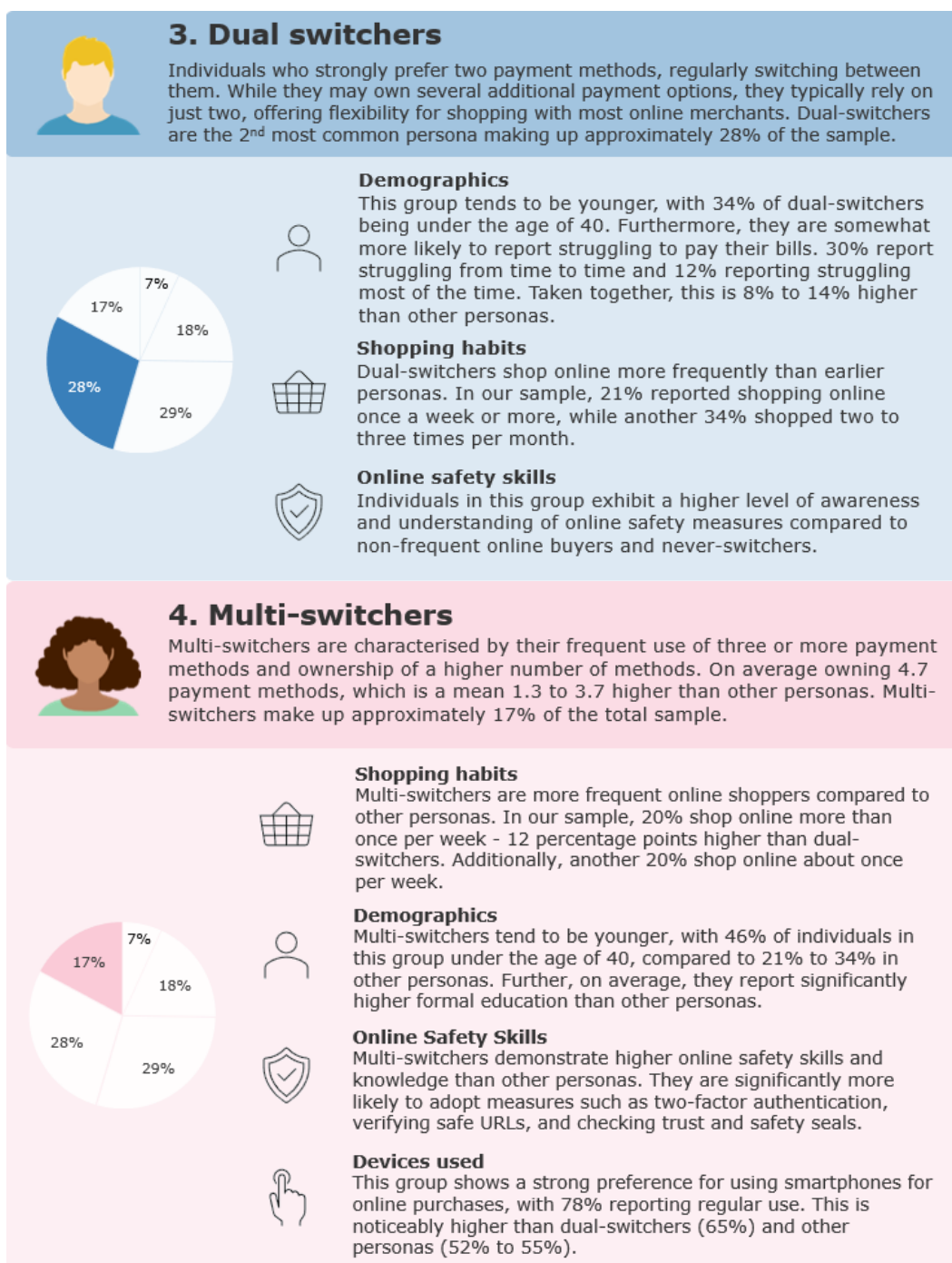
*Source: Project Team elaboration*

Below, we describe each persona: starting from the characteristics that define them, we assess the differences between behaviours, attitudes and demographics between them. A technical explanation of the segmentation used to define the personas is provided in Annex E.

The relevant variables and characteristics that define each persona were based on the regression model of personas. Each group’s distinct characteristics provide valuable insights into their decision-making processes and interactions with online merchants.

Figure 2.31: Relevant variables and characteristics defining each persona





Source: Project Team elaboration

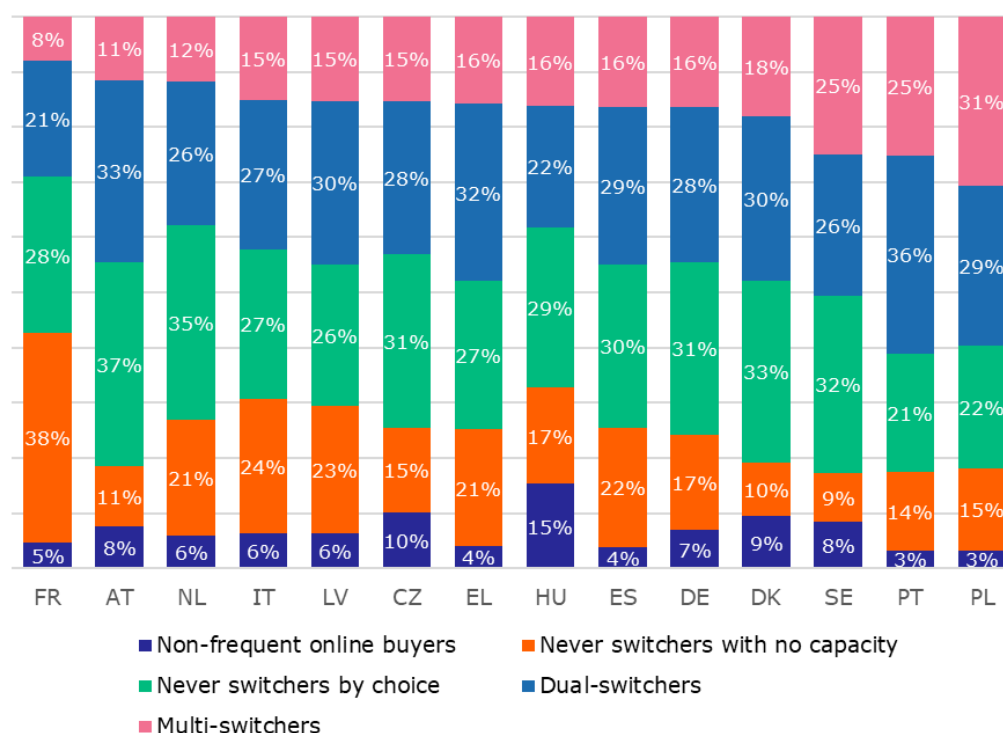
## Personas across countries

When examining the distribution of personas across countries, some differences emerge. The proportions of never switchers by choice, dual-switchers, and non-frequent online buyers tend to remain relatively consistent across countries. In contrast, the proportions of multi-switchers and never switchers by choice exhibit significantly greater variation.

Portugal and Poland have the highest combined proportions of multi-switchers and dual-switchers (61% and 60%, respectively), which is 10 percentage points higher than the next country, Sweden. Meanwhile, France has the largest combined proportion of never

switchers (both by choice and with no capacity), with 66% of respondents falling into these personas. This is also 10 percentage points higher than the following country, the Netherlands.

**Figure 2.32: Distribution of personas per country**



Source: Consumer survey (N=11532)

### Payment method ownership across personas

Across all personas, online banking, Paypal, and international cards (debit and credit) emerged as the most popular payment methods. For dual-switchers and never switchers by choice, these three options also represented the most common combination of payment methods. See Figure 2.33 for graph of this data.

In addition to these, a majority of multi-switchers reported owning a digital wallet like Apple Pay or Google Pay, highlighting their tendency to adopt a broader range of payment options.

Among never switchers with no capacity, about one-third reported owning only an international card, 30% reported owning only an online banking method, and approximately a quarter stated they owned only Paypal.

This last data point raises questions about the reported responses. Since Paypal functions as a wallet, it requires another payment method - such as a credit card or bank account- linked to it for use. This discrepancy suggests that some never switchers with no capacity may have either failed to report or misremembered a linked payment method. Alternatively, they may never have used the linked method to make an online purchase, which was a condition specified in the survey question about payment methods.

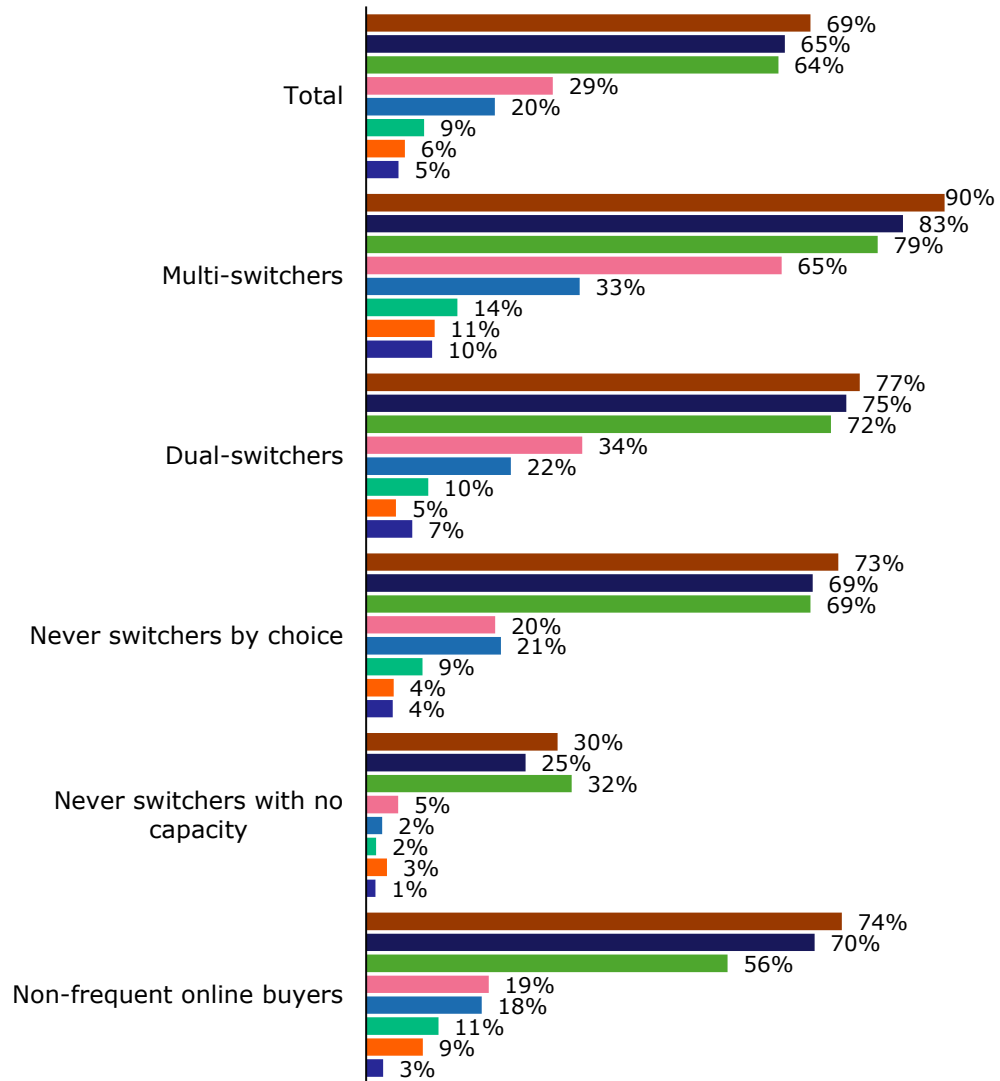
This caveat should be taken duly into account when assessing the relevance of cards. Unlike online banking (e.g. bank transfers) and online banking methods (e.g. Bizum), the ownership of cards and digital wallets is assessed separately. However, it's likely

that owners of digital wallets also own cards, and respondents may have failed to report owning cards when they indicated they own digital wallets.

An important caveat to the data presented below is that it does not reflect whether respondents owned multiple payment methods within each cluster. Instead, it only indicates whether a respondent owned at least one method within each cluster. For instance, if a respondent owned multiple cards, this would not be captured in the data.

**Figure 2.33 Ownership of payment types**

E.5 Which of the following payment methods do you have and have used to make online purchases? (N=11532)



- Online banking and methods based on online banking
- PayPal
- International cards
- Big tech wallets (Apple Pay, etc.)
- BNPL & "pay in instalments" platforms
- Other digital wallets
- Other
- Domestic cards

Source: Consumer survey

### 2.3.1.2.3. Experience and skills shaping habits

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#### Key take-aways

- **Negative experiences:** Multi-switchers reported the highest incidence of negative online payment experiences, while never-switchers by choice were the least affected.
  - **Financial literacy & safety:** Multi-switchers showed strong online safety skills but weaker financial literacy, whereas never-switchers by choice displayed higher financial literacy and a more cautious approach. Never-switchers with no capacity scored low in both areas, limiting their payment behaviours.
  - **Framing techniques:** Multi-switchers were the most likely to notice framing techniques, while never-switchers by choice and non-frequent online buyers had the lowest awareness.
- 

#### Drivers for switching

Beyond the tendencies of personas outlined in the previous sections, there are several unique and personal factors that influence individuals' choice of payment method or their decision to switch methods at check-out. This subsection and the following two will explore these key drivers of persona belonging and consumer behaviour in detail, supported by relevant data from the consumer survey.

These subsections explore three key areas influencing payment method preferences and switching behaviours. First, experience, skills, and habits, such as past negative experiences, financial literacy, and digital skills, shape individual choices. Second, views and attitudes, such as trust in e-commerce platforms, concerns about payment security, and openness to new methods, play an important role. Finally, demographic factors like age, income, education, and country further are investigated as well.

Before delving into these factors, it is important to acknowledge a fundamental precondition: an individual's ability to switch payment methods depends on having access to more than one method. In our sample, approximately 20% of respondents reported owning only a single payment method, independent of which payment methods merchants offered. Assuming these responses are accurate, these individuals, by definition, cannot switch payment methods and are thus unaffected by attempts from merchants at check-out to influence payment choices.

#### Prior negative experiences

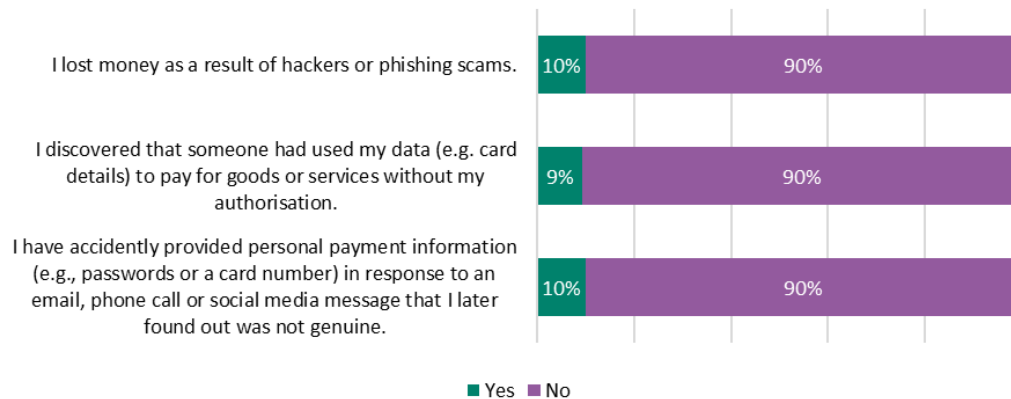
Payment method choices, like any behaviour, are influenced by knowledge, skills, habits, and past experiences. Our survey focused on two key areas of knowledge and skills - financial literacy and digital skills - while also exploring past negative experiences with online payments and general shopping habits.

When examining negative experiences, respondents were asked whether they had mistakenly shared personal payment information, discovered unauthorized use of their payment details, or lost money to a hacker or phishing scam.

Across the entire sample, we find that an even proportion of 9% to 10% of respondents report experiencing each of the three scenarios (see Figure 2.34).

**Figure 2.34: Prior negative experiences**

G8. Thinking about paying for products and services online, in the last 2 years, have you experienced any of the following issues? (N=11.243)



Source: Consumer survey

When segmenting the data by personas, multi-switchers were the group most likely to report all three experiences. For instance, 18% of multi-switchers reported having accidentally providing personal payment information before, compared to only 8% of the remaining sample. They were also significantly more likely to report unauthorized purchases or financial losses due to hacking or phishing scams.

In contrast, never-switchers by choice were the least likely to have encountered such issues: across the three events, only 7% of this group reported these issues.

#### Financial literacy and online safety skills

Financial literacy in the survey was measured using two standard questions requiring respondents to calculate interest rates—skills that may influence decisions about using credit cards versus other payment methods. Online safety skills were assessed by asking respondents how they typically verify the security of an online merchant or payment method.

On average, 82% of respondents answer correctly across the two financial literacy items<sup>127</sup>, while 18% respond incorrectly.

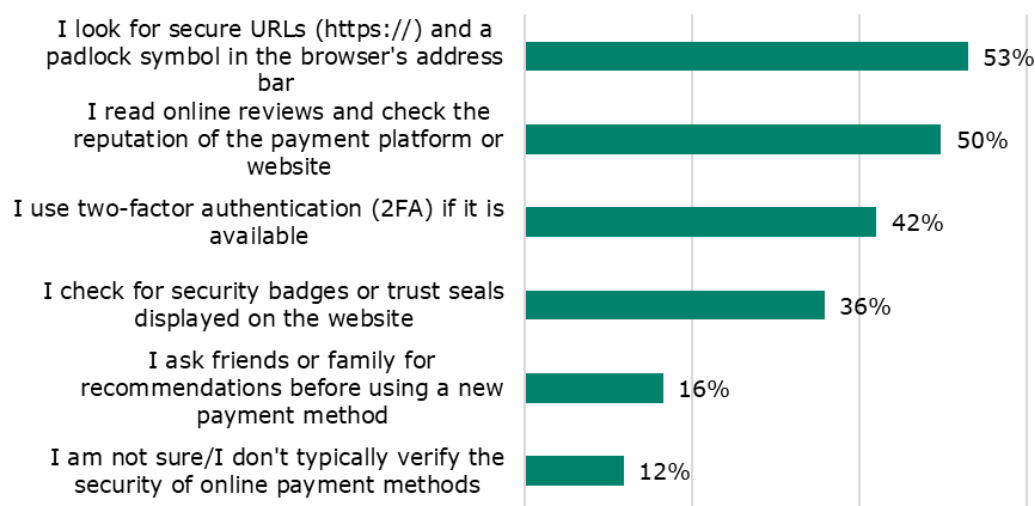
When investigating the data segmented by personas, we find that multi-switchers and never-switchers with no capacity both scored significantly lower in financial literacy, despite representing opposite extremes in payment method usage. While multi-switchers frequently use multiple payment methods, never-switchers with no capacity rely on a single option. In contrast, never-switchers by choice - those with the capacity to switch but who prefer not to - scored higher in financial literacy, hinting at a more deliberate and cautious approach to payment choices.

<sup>127</sup> H1: "Suppose you had EUR 100 in a savings account and the interest rate was 2% per year. After 5 years, how much would you have in the account if you left the money to be?"; and H2: "Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, with the money in the account, would you be able to buy...".

Regarding digital safety measures, about half of the respondents check for secure URLs and read online reviews, while approximately 12% do not use any of the listed online safety strategies.

**Figure 2.35: Security checks**

H3. When using online payment methods, how do you typically verify the security of a website or payment platform before making a transaction? (N=11.532)



Source: Consumer survey

Note: Percentages indicate proportion of respondents indicating they use the particular safety measure. Respondents could select multiple statements.

Interestingly, multi-switchers demonstrated higher online safety skills, such as frequent use of two-factor authentication. Yet, they also reported a higher number of negative experiences with online payments, such as fraud or phishing, suggesting that high safety skills do not fully shield individuals from risk. This contradiction may also be related to this groups' higher frequency of online shopping and online payment usage which may open them to higher risk than other groups. Alternatively, individuals who have made negative experiences may consequently decide to adopt more stringent security measures. Meanwhile, never-switchers with no capacity scored significantly lower in online safety skills, potentially limiting their confidence in exploring or adopting additional online payment options.

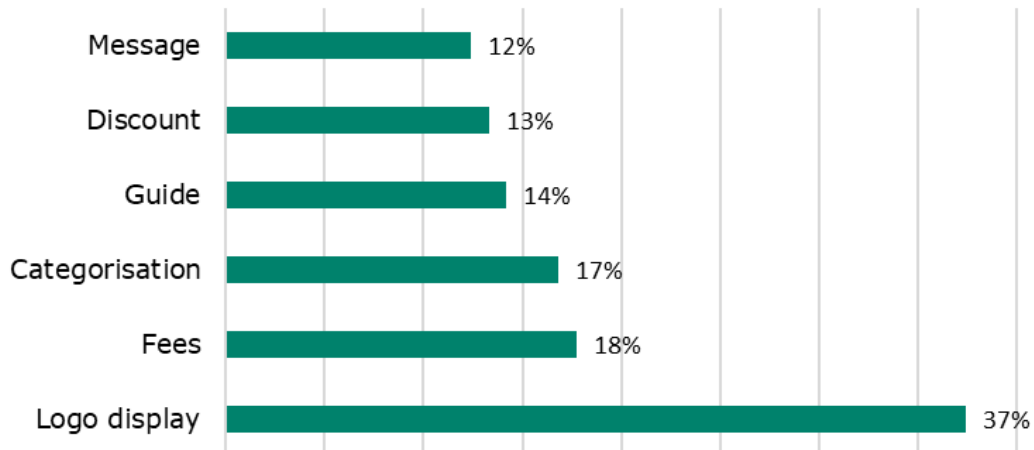
#### Awareness of display practices

The consumer survey also asked respondents to rate how often they noticed the display practices implemented by merchants at check-out. This may be an important factor, as the ability to recognise attempts by e-commerce platforms to influence consumer choices can help shield individuals from manipulation. In the mystery shopping exercise, 10 display practices were coded and observed (see 1.2.2 for a description of each practice).

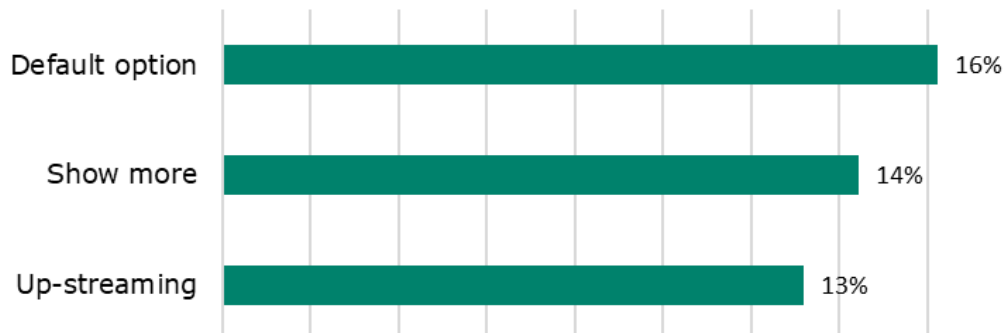
Across the entire sample, the proportion of respondents who frequently or always notice display practices (excluding logo displays) ranges from 12% for nudge messages to 18% for fees (see Figure 2.36). Expectedly, logo displays stand out, with 37% of respondents reporting they notice them often.

**Figure 2.36: Awareness of display practices in online shopping (entire sample).**

GX. How often do you notice each of the following in the check-out process when shopping online? Summary of Very often or always. (N=11532)



**Continued - framing techniques investigated in experiment**



Source: Consumer survey

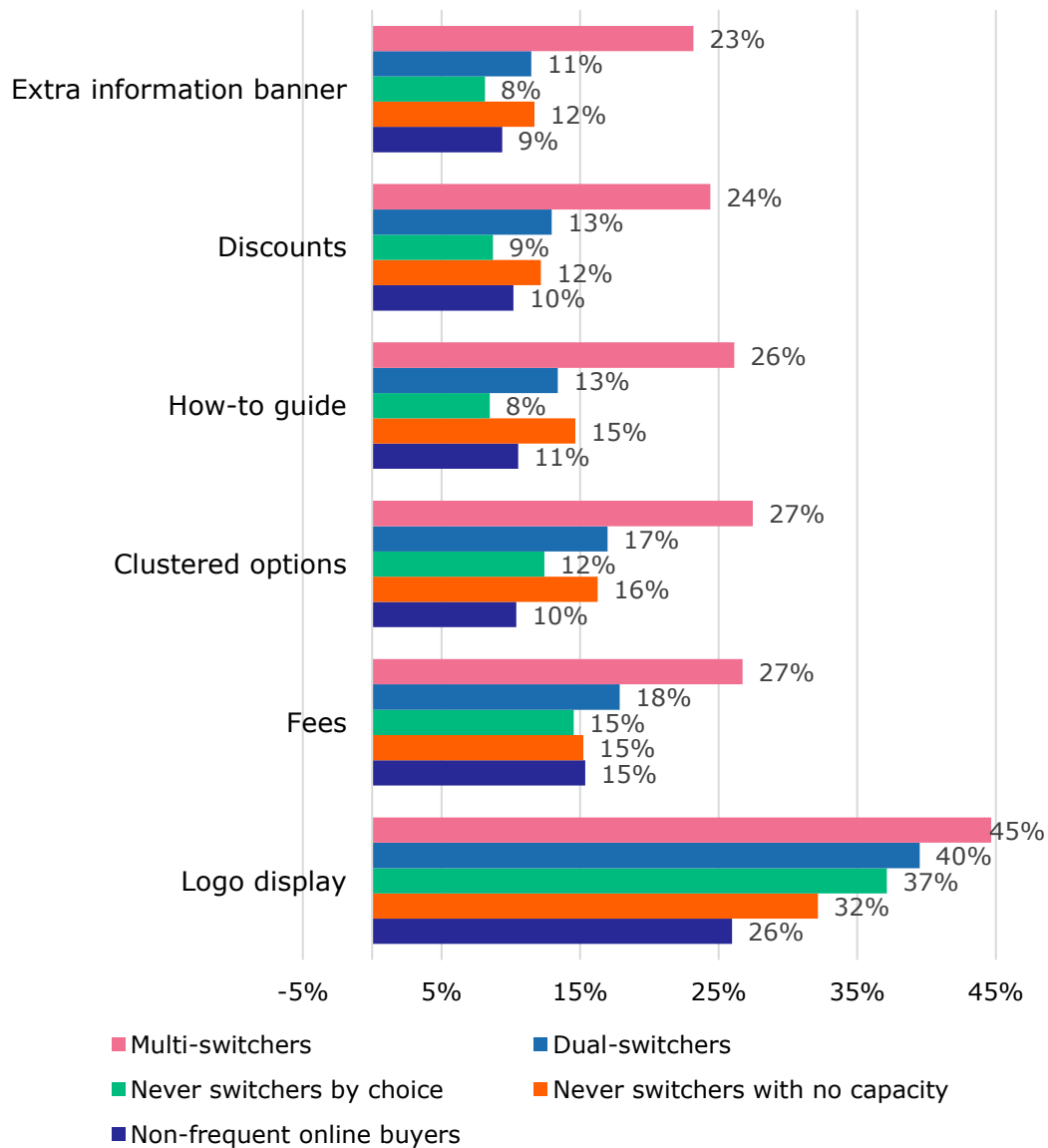
Note: The practices were described in detail in the survey.

However, when segmenting the data by personas, a different pattern emerged. We find that not all personas are equally likely to notice display practices: Across all display practices, multi-switchers were the most likely to frequently notice these tactics (see Figure 2.36). For all techniques except logo displays, approximately 25% of multi-switchers reported noticing these techniques very often or always.

In contrast, dual-switchers and never switchers with no capacity were somewhat less likely to report frequent exposure, with 12% to 18% indicating they noticed these techniques. Meanwhile, never switchers by choice and non-frequent online buyers reported even lower rates of awareness, ranging from around 8% to 12%.

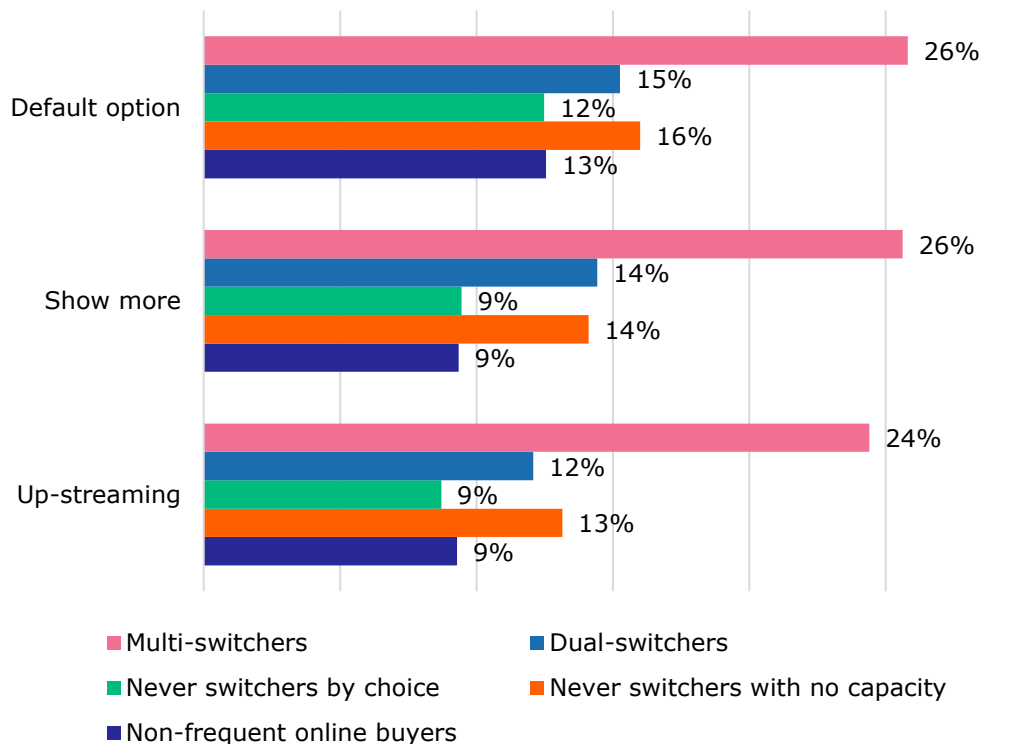
**Figure 2.37: Awareness of display practices in online shopping<sup>128</sup>**

GX. How often do you notice each of the following in the check-out process when shopping online? Summary of Very often or always. (N=11532)



Source: Consumer survey

<sup>128</sup> Percentage of respondents per persona that report noticing each framing techniques very often or always (6 or 7) when they shop online. This figure only shows nine different display practices because the typology was changed after the consumer survey was finalised: *Default option* was divided into two to reflect nuance in how strongly an option is pre-selected (auto-selected vs. visually more prominent), fees and discounts were combined into a single category (*monetary references*), and *extra information banner* was divided into two categories to reflect differences in tone of the message (more neutral information vs. highlighting benefits of specific methods).

**Figure 2.38: continued - framing techniques investigated in experiment<sup>129</sup>**

Source: Consumer survey

#### 2.3.1.2.4. Attitudes and preferences

##### Key take-aways

- **Novelty:** Significant factor in persona belonging. Multi-switchers are the most novelty-seeking group, actively exploring new options, while never-switchers by choice show the least openness to trying new payment methods.
- **Trust:** Trust in online platforms, payment methods, or consumer protection was rarely a significant predictor of persona group membership.
- **Preferences:** There is agreement across personas on desirable fundamental features of payment method but multi-switchers prefer additional features.

A further broad group of variables in understanding shopper behaviour relates to their views, attitudes, and preferences towards merchants and payment providers. Our survey explored participants' sense of trust and security in both merchants and payment options, as well as their general trust in consumer protection offered by authorities. Additionally, novelty-seeking behaviour may play a role in predicting individuals' curiosity and willingness to try new payment options.

<sup>129</sup> Percentage of respondents per persona that report noticing each framing techniques very often or always (6 or 7) when they shop online.

## Novelty

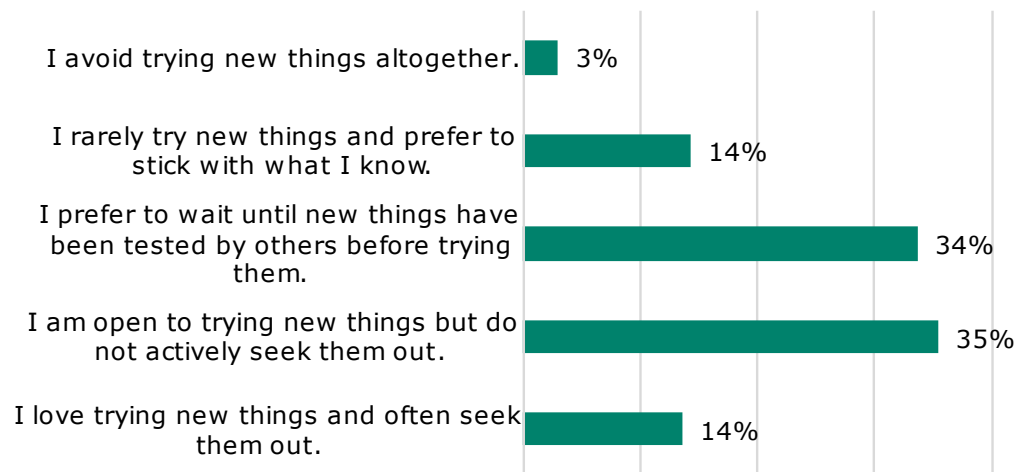
Attitudes towards novelty were assessed by asking respondents about their general approach to new products and services—specifically, how open they were to trying new things and whether they actively sought them out. Respondents were presented with five statements and asked to select the one that best described their attitude.

In this question, we see that a large majority of the sample (69%) selects one of two statements:

- 1) "I prefer to wait until new things have been tested by others before trying them.", or
- 2) "I am open to trying new things but do not actively seek them out"

**Figure 2.39: Attitudes towards novelty (entire sample)**

H8. How do you generally feel about trying new products or services? Please select the statement that best describes your approach. (N=11532)

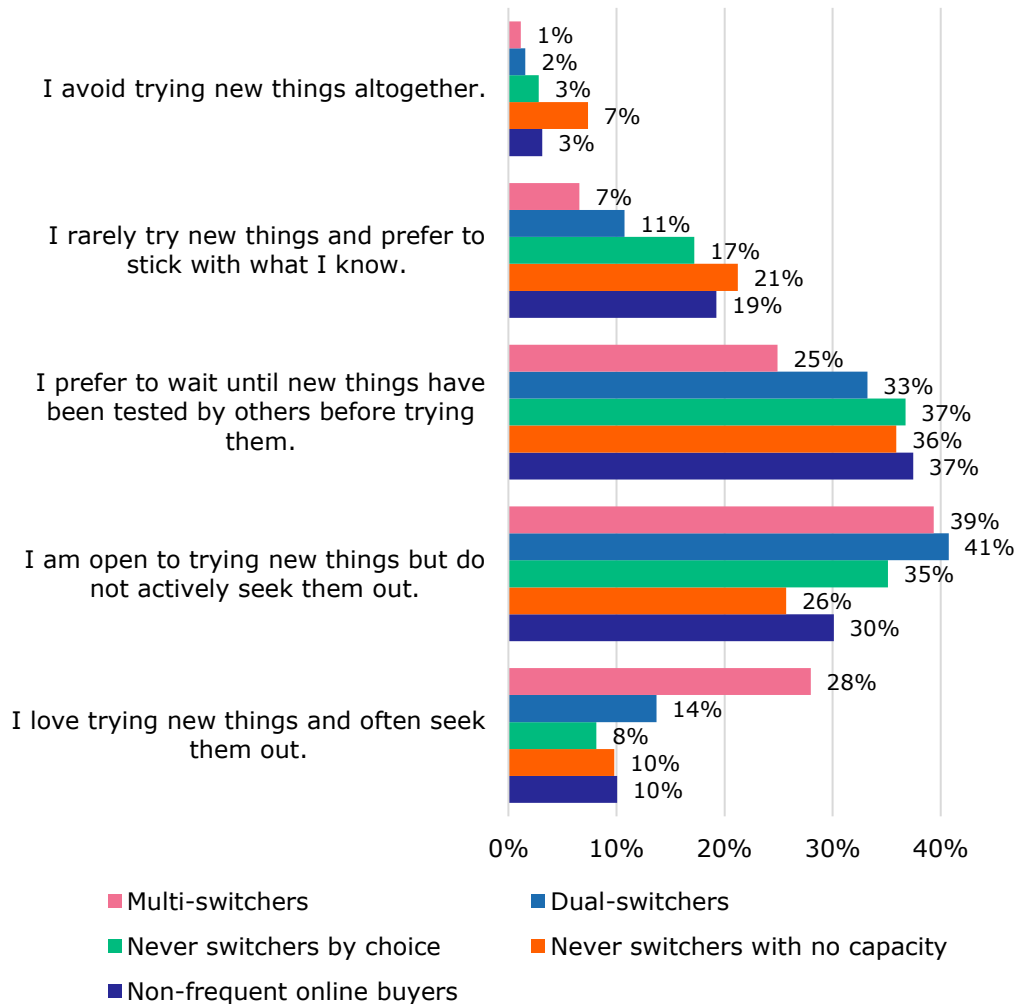


Source: Consumer survey

However, when analysing the results to this question by persona, we find two significant effects. Firstly, multi-switchers are much more likely to select the statement indicating the highest willingness to seek novelty, with 28% selecting, "*I love trying new things and often seek them out.*" In contrast, only 14% of dual-switchers, the next highest group, selected this statement. Secondly, never-switchers by choice scored significantly lower in novelty seeking, indicating a more cautious approach to trying new payment options (see Figure 2.40).

**Figure 2.40: Attitudes towards novelty per persona**

H8. How do you generally feel about trying new products or services? Please select the statement that best describes your approach. (N=11532)



Source: Consumer survey

### Trust in payment methods, platforms, and consumer Protection

Trust in the safety of online transactions—such as safeguarding personal information and money—as well as trust in authorities to provide support in cases of payment issues, was hypothesised to play an important role in payment method preferences.

Across the entire sample, trust in payment providers (H6) and e-commerce platforms (H5) appears similar. High trust (ratings of 8, 9, or 10 on an 11-point scale) is reported by 33% and 34% of respondents, respectively, while low trust (ratings of 0 to 4) is indicated by 17% and 18%. Confidence in payment providers or authorities (H7) in the case of fraud is somewhat lower: only 22% indicate high confidence while 28% low confidence.

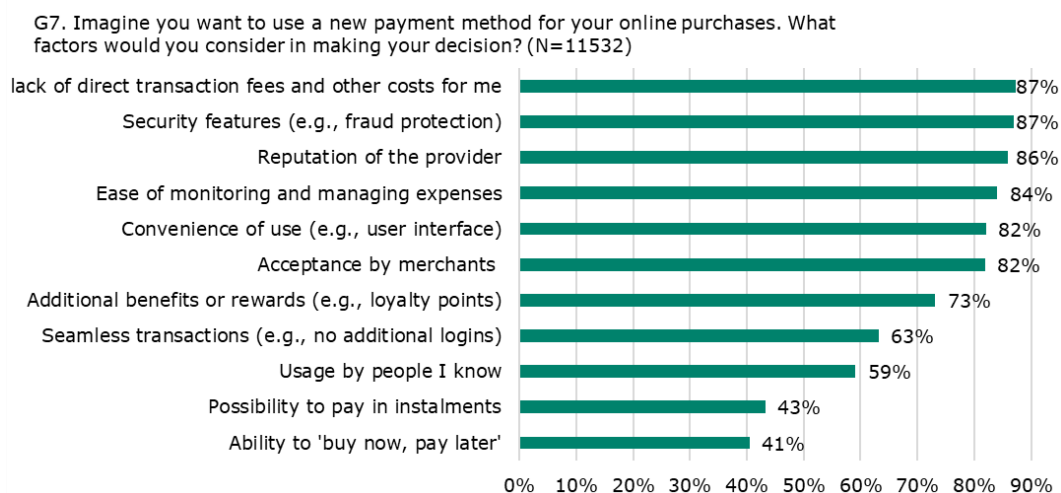
**Figure 2.41: Sense of trust in e-commerce platforms, online payment methods, and public authorities**

Source: Consumer survey

When we analyse the data segmented by personas, we find (almost) no statistical differences. Our regression model revealed that trust in online platforms, payment methods, or consumer protection was rarely a significant predictor of belonging to a particular persona.

The only difference was that never-switchers by choice stood out as statistically slightly more likely to report higher trust in payment methods (H6) but slightly lower trust in consumer protection (H7).

### Preferences for payment method features

**Figure 2.42: Preferred features in payment methods**

Source: Consumer survey

When examining the preferred features of payment methods, notable differences emerge between personas. Generally, multi-switchers and dual-switchers demonstrate higher standards compared to other groups. They are more likely to rate various features as important when choosing a payment method. However, for the four most

universally valued features—transaction fees, security features, reputation, and convenience—the differences between personas are relatively small, with all groups falling within an 8-percentage-point range. This indicates broad agreement on the fundamental aspects of payment method preferences.

The distinctions between personas become more pronounced when it comes to additional e-commerce platform features. For instance, the ability to "buy now, pay later" is rated as an important feature by 58% of multi-switchers, compared to just 31% of non-frequent online buyers and 41% of dual-switchers. Similarly, multi-switchers place greater value on convenience-related features, such as the ability to save preferred payment methods, than other groups.

**Figure 2.43: Preferred features in payment methods per persona**

G7. Imagine you want to use a new payment method for your online purchases. What factors would you consider in making your decision? (N=11532)

	Non-frequent buyers	Never switchers with no capacity	Never switchers by choice	Dual-switchers	Multi-switchers
Lack of direct transaction fees and other costs	83%	81%	89%	89%	90%
Security features (e.g., encryption, fraud protection)	81%	82%	89%	89%	88%
Reputation of the provider	80%	81%	88%	87%	88%
Ease of monitoring and managing expenses	79%	80%	84%	85%	88%
Convenience of use (e.g., ease of setup, user interface)	76%	76%	83%	84%	86%
Acceptance by merchants	73%	77%	82%	84%	86%
Additional benefits or rewards (e.g., cashback, loyalty points)	63%	70%	69%	76%	82%
Seamless transactions (e.g., preferred payment methods are saved)	52%	60%	59%	65%	75%
Usage by people I know	49%	59%	53%	60%	69%
Ability to 'BNPL'	31%	38%	34%	41%	58%

Source: Consumer survey

Note: Summarises percentage of each group that rated each feature with 6 through 10 (extremely important) on a 10-point scale.

### 2.3.1.2.5. Demographics

#### Key take-aways

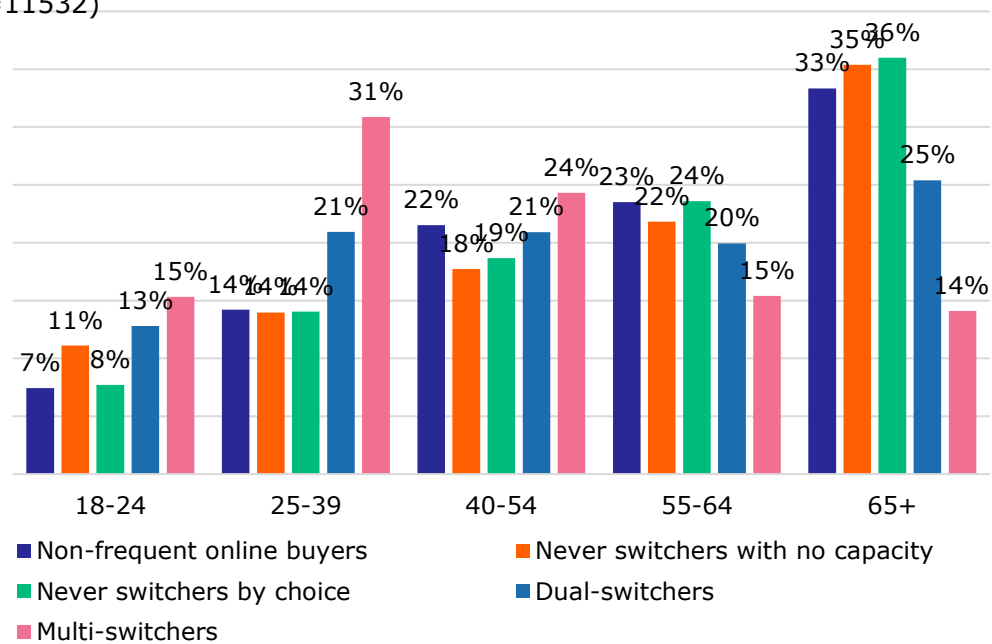
- Of the demographic factors, gender, educational attainment, and financial stability were largely insignificant predictors of persona type.
- Age was a significant factor: multi-switchers tend to be younger than other personas.

Demographic factors such as age, gender, income, and education are commonly studied as predictors of consumer choices regarding online payment methods or included as control variables in the literature. They are frequently found to be a relevant variable in consumer behaviour.

In the regression model, age emerged as a significant predictor of persona belonging for most age groups and personas.

**Figure 2.44: Age distribution of respondents per persona**

E2. How old are you? Please indicate your age band.  
(n=11532)



Source: Consumer survey

Multi-switchers were significantly younger, on average, than other personas. Almost half of this group was younger than 40 years old while only 22% to 34% were between 18 and 40 years of age in the remaining personas. Dual-switchers also tended to be younger than other personas but older, on average, than multi switchers.

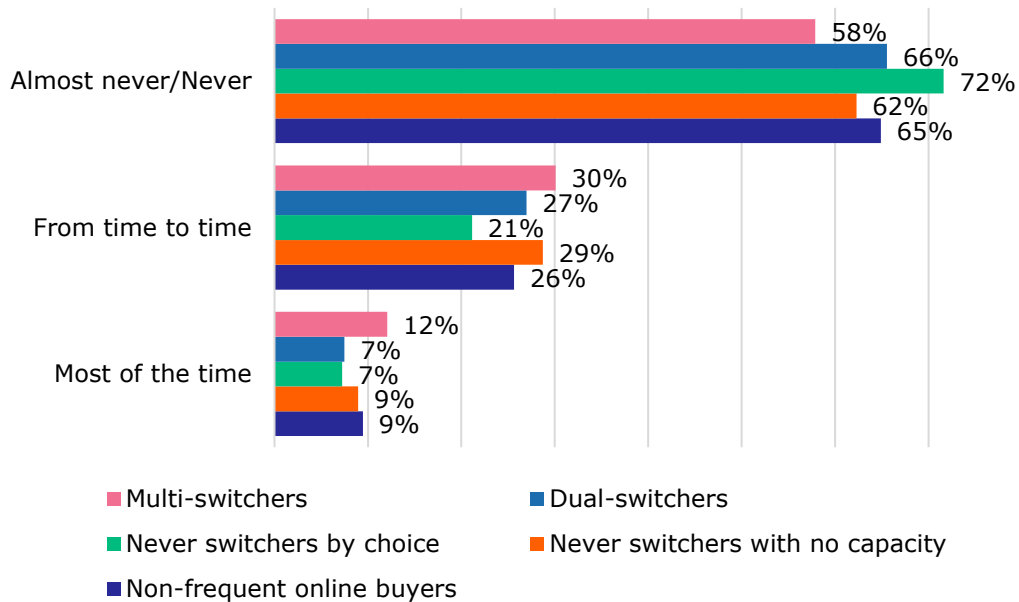
Gender was largely an unresponsive variable and was only a significant predictor in the regression model for the never-switchers with no capacity persona. In this group, 44% identified as women, and 56% as men.

Similarly, educational attainment was mostly insignificant. The only exception was for dual-switchers, where higher education status showed a slight positive correlation with belonging to this persona. This suggests that individuals with higher educational levels were somewhat more likely to be dual-switchers.

There were modest differences in the average financial stability across the persona groups, specifically in terms of their ability to pay bills at the end of the month. Multi-switchers were slightly more likely to report experiencing financial instability, while never-switchers by choice tended to exhibit greater financial stability. Notably, never-switchers by choice were the only group for which income emerged as a statistically significant predictor of persona belonging in the regression model.

**Figure 2.45: Financial stability per persona**

H4. During the last twelve months, would you say you had difficulties paying your bills at the end of the month?  
(N=11532)

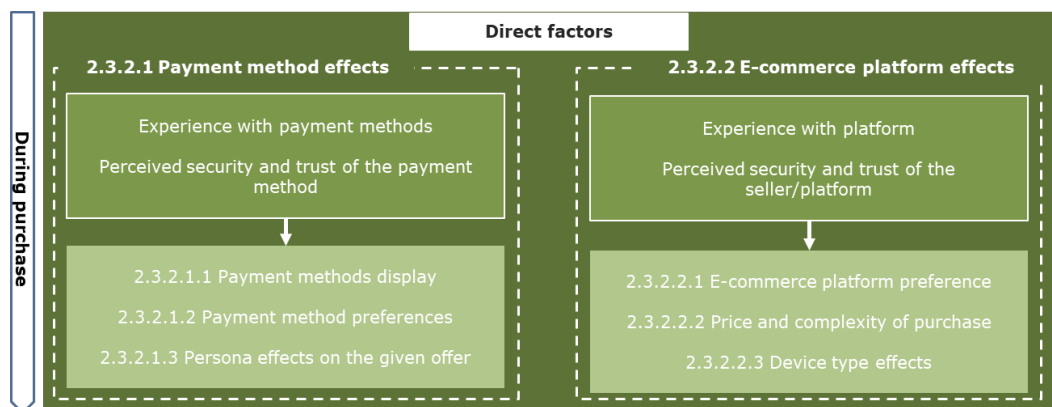


Source: Consumer survey

### 2.3.2. Direct factors – during the purchase

The theoretical model postulates that at the time of purchase two main categories of factors have an influence on payment method decision. On one hand there are the factors linked to the payment method display and how the available payment methods are presented to the consumer.

On the other hand, direct factors include the platform on which the payment is being made and its proprietary factors. This category regroups all the factors that are linked to the type of purchase made, for instance, the type of product, which vendor is chosen, through which channel this vendor is accessed. This category also incorporates the effects of personas on the payment method decision.

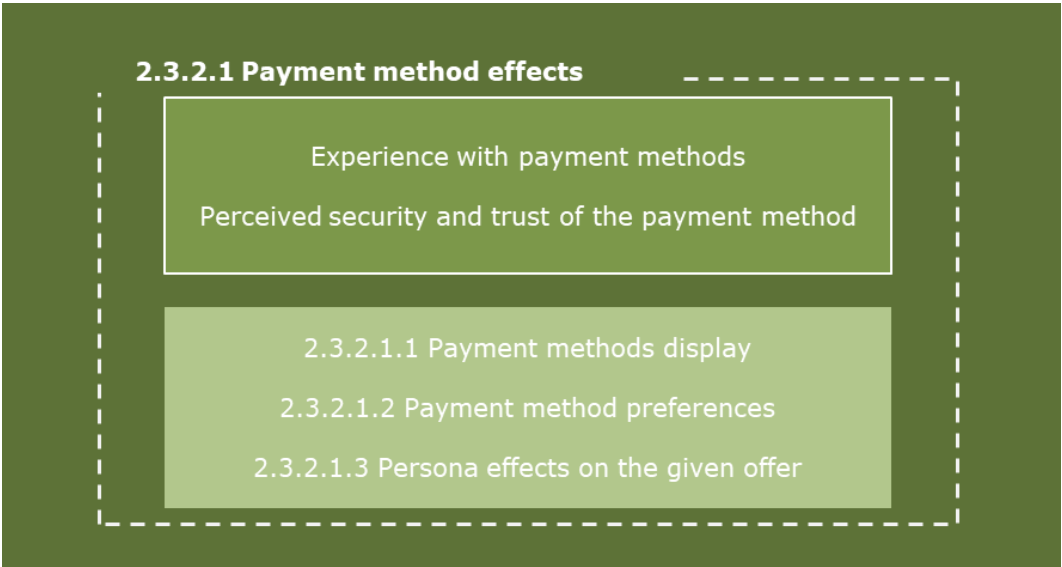
**Figure 2.46: Direct factors**

Source: Project Team elaboration

2.3.2.1. Payment method effects

One of the key direct factors expected to be significant in informing payment method selection by consumers, are payment method effects. Payment method characteristics include both display practices, payment method preferences, and persona effects. As aforementioned, display practices are the techniques carried out by e-commerce platforms describing how they display payment methods to consumers, and likely has an effect on the choice of payment method, particularly in how they restrict choice freedom and choice architecture, or how choice presentation affects decision-making. It is also likely that payment method preferences, the selected payment method, both in Tasks 1 and 2, and the payment method suggested by the display practice have an effect on the likelihood to switch payment methods. Individual behaviours will certainly also affect how consumers choose in purchasing environments. We assess these effects in the behavioural experiment in which consumers are placed into a hypothetical purchasing scenario and are exposed to different display practices, and their purchasing decisions are recorded. The effects were tested through a regression model. This section will go through the key results regarding display practices, payment method preferences, and persona effects.

Figure 2.47: Payment method effects



Source: Project Team elaboration

### 2.3.2.1.1. Payment method display

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#### Key take-aways

- On average, 39% of respondents changed payment methods to the one recommended by the display practice while 12% changed payment methods to one not recommended by the display practice. The order of the selected payment method was also affected as the position of the selected payment method was on average 0.65 positions higher in Task 2 than in Task 1.
  - All display practices influenced payment selection, though to varying degrees. The show-more method had the strongest impact on driving shoppers towards a suggested payment method with 4 out of 5 shoppers having their payment choice influenced by the display practice. The default option and upstreaming were less effective, leading to deviations from preferred choices in 22% and 15% of cases, respectively. While there is no indication of what the likelihood to switch is independent of display practices, and thus no way to compare the display practices with the absence of a display practice, the effects are nevertheless significant between themselves. This confirms that show-more and default to a lesser extent, which can significantly disrupt choice architecture, do seem to influence consumers' payment choices.
  - Unexpected effects emerged in some cases, particularly with upstreaming. 1 in 5 respondents who encountered upstreaming changed from their preferred choice in Task 1 to a payment method that was not suggested, indicating potential resistance. In contrast, only 6% of respondents displayed this behaviour under the default option, and the show-more resulted in almost no such deviations.
  - Display practices also influenced payment selection behaviour in terms of positioning. Shoppers were more likely to select payment methods positioned higher on the selection page in Task 2 than in Task 1, when no display practices were present. This effect was most pronounced with show-more, where respondents selected significantly more prominently positioned payment methods. The default option had a moderate effect, while upstreaming had the weakest impact on selection.
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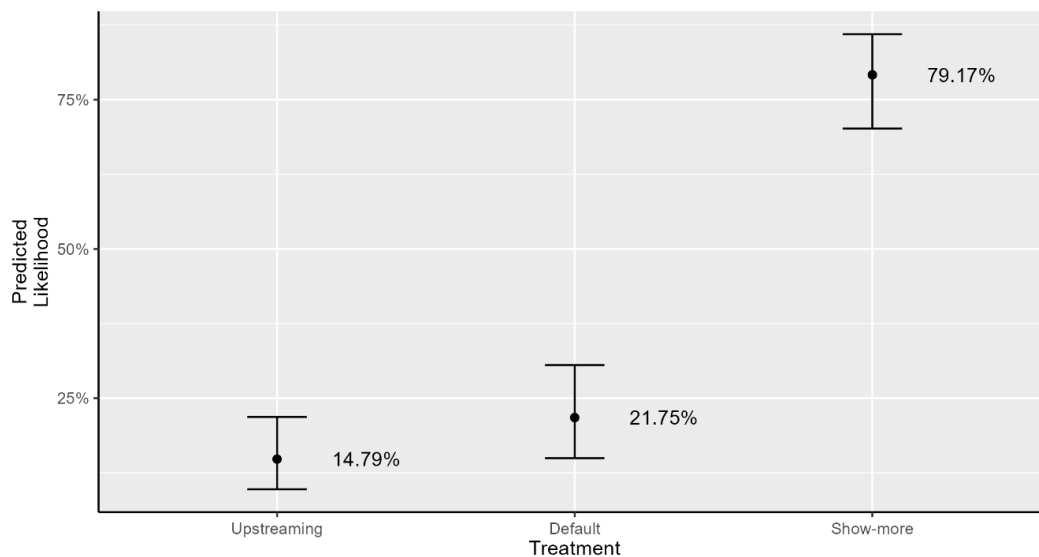
Display practices are likely to be significant in directing consumer behaviour and was one of the main explanatory variables we wanted to test in the experiment. Important is to understand how a display practice may affect consumer choice. For example, many display practices affect freedom of choice and choice architecture and may try to push preferred payment methods over others. This informed how the experiment was designed, and particularly the dependent variables. These are:

1. Outcome 1 - Whether the respondent changing payment options from the one they selected in Decision Task 1, to the payment option proposed by the treatment. For upstreaming, this was the payment option shown in the upstreaming button, for default, this was the payment option already selected for the consumer, and for show-more this was any of the three payment options shown above the show-more button.
2. Outcome 2 - Whether the respondents switch payment options from the one they selected in Decision Task 1, to any payment option not proposed by the treatment.
3. Position - The position of the selected payment method in the payment method list, in both Decision Tasks 1 and 2.

When it comes to Outcome 1, overall, 39% of respondents changed payment methods between Tasks and selected the payment method suggested by the display practice. When switching to a payment method not suggested by the display practice, this share was only 12%. The position of the selected payment method was also affected by the task. In Task 1 the average position of the selected payment method was 4.38, which decreased to 3.73 in Task 2, such that respondents selected a payment method on average 0.65 positions higher in Task 2.

Looking at how effective each display practice is at inciting respondents to change payment methods to the treated payment method, we see that according to the model, show-more is significantly more effective than either defaulting or upstreaming. The difference between upstreaming and default is not shown to be significant. The graph below shows the predicted likelihood of changing for each display practice.

**Figure 2.48: Display practice effect on the likelihood of changing payment method based on treatment recommendation**

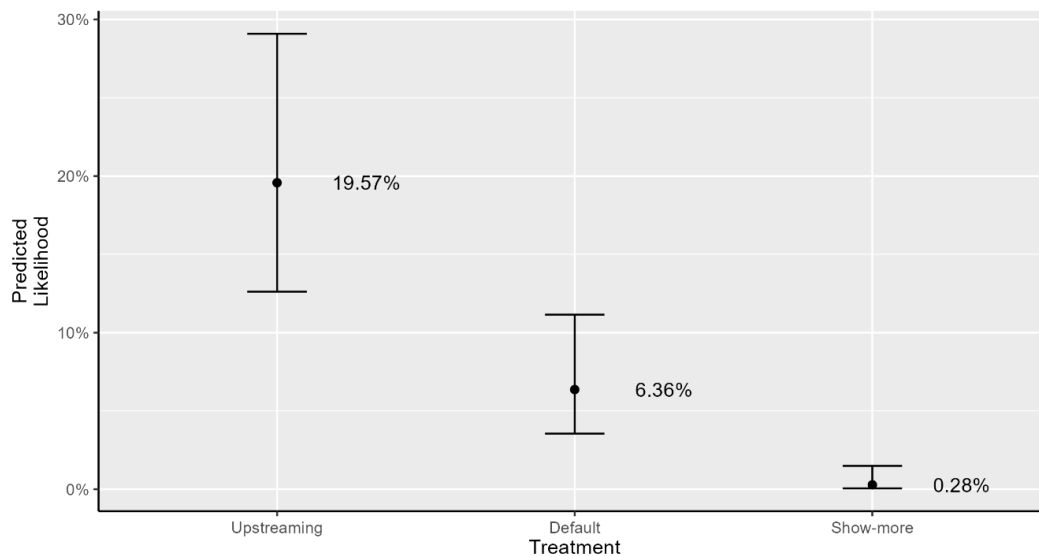


Source: Consumer survey

As the dependent variable was defined such that having selected any of the three payment options above the show-more button was identified as having changed to the treated payment method, and there was only one payment option for upstreaming and default for which this would have been relevant, it is no surprise that show-more is shown to be much more effective given that there are more options available for consumers to change to. While the difference between default and upstreaming are not shown to be significant, anecdotally, there seems to be a trend in which default is slightly more effective. There may be various reasons for such a result, such as the unconventional nature of upstreaming being rather foreign to many respondents.

For the second dependent variable, Outcome 2, on changing to a payment method not treated by the display practices, we see there are significant differences between each of the three display practices, with upstreaming having the greatest effect on selecting a new payment method, with default and show-more having respectively smaller effects. The difference in the size of the effect between default and upstreaming is smaller than that for default and show-more. The graph below shows the predicted likelihood of changing to an un-treated payment method for each display practice.

**Figure 2.49: Display practice effect on the likelihood of changing payment method not recommended by treatment**



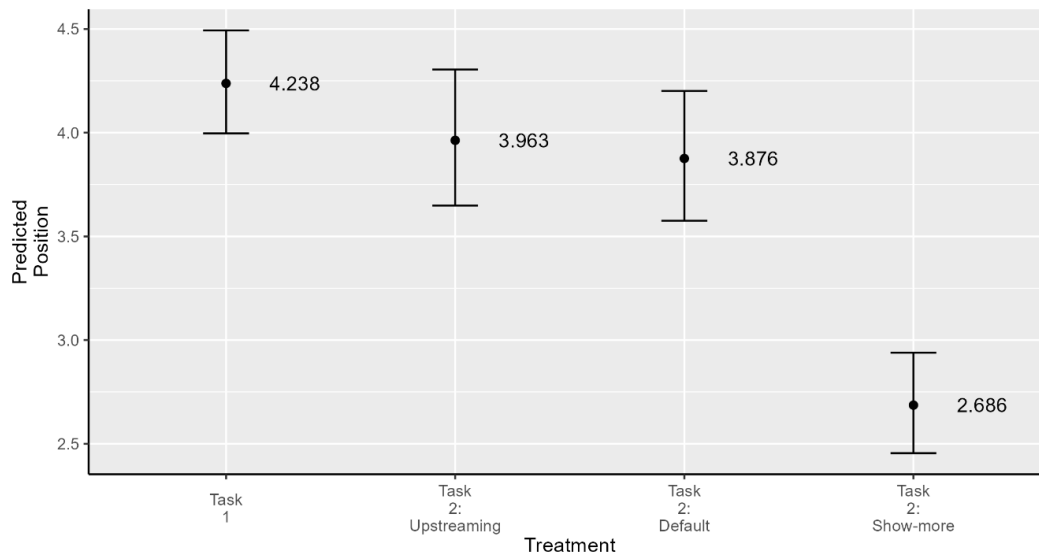
Source: Consumer survey

The results show that for "Show-more" there are exceedingly few respondents who did not select any of the three payment methods above the show-more button and did not select the same payment method as in Decision Task 1. This may be due to respondents that are undeterred by the show-more button and opt to view the entire list of payment methods do so to find their preferred payment method. This also gives credence to the notion that the payment method selected in Decision Task 1 is indeed the preferred payment method of the respondent.

With default, we see a predicted likelihood of 6% of selecting a different and un-treated payment method than in Decision Task 1. This type of behaviour may be explained by consumers who may have multiple preferred payment methods, that are not defaulted, but the consumer selects the preferred payment method that is higher in the list, which is not the one selected in Decision Task 1. This may suggest that dual or multi-switchers may exhibit such behaviours.

For upstreaming, the effect is the greatest as many respondents may not have noticed or actively chose not to select the upstreaming option, and when faced with a randomised list of payment methods, chose the preferred payment method highest on the list, which in these instances where respondents likely had multiple preferred payment methods, was not the payment method selected in Decision Task 1.

With the dependent variables Outcome 1 and 2, we are only able to compare between display practices and are not able to produce a comparison with the absence of display practices (a straightforward randomised list of payment methods). As such, in order to assess this comparison, the third dependent variable was designed. Concretely, the dependent variable was the position of the selected payment method in the payment method list. As such, we could compare the selected positions in Decision Task 1 when there was no display practice present and Decision Task 2 when there was a display practice present to test whether there were any significant effects. The results show that all display practices have a significant effect on selecting a position in the list higher in Decision Task 2 than in Decision Task 1. The effect of upstreaming is the smallest, with default and show-more with respectively greater effects. The graph below shows the predicted position of the selected payment for Decision Task 1 and for each display practice in Decision Task 2.

**Figure 2.50: Display practice effect on the position of selected payment method**

Source: Consumer survey

Note that the position denotes order such that the highest position is signified as 1, and the lowest position as 8. As such, a position with a lower number denotes a position higher in the randomised list.

In the absence of any display practices, the predicted position of the selected payment was 4.238. For upstreaming, the decrease in the position is the lowest signifying that the effect is the weakest. This is understandable as the display practice is only materialised prior to the payment list, and thus if the upstreaming option is not selected, the respondent is once again faced with a similar payment list in which they are likely to exhibit the same behaviour as they would have in Decision Task 1. With defaulting this effect is likely larger, given that some respondents are affected by the display practice and select the first payment option, whereas others simply select their preferred payment method which is in positions 2 to 7. The effect again is much larger for show-more than the other payment methods, leading to the conclusion that it is by far the most disruptive of the choice freedom and architecture such that a majority of respondents select a payment method in the first 3 positions, and very few select a payment method outside of that.

### 2.3.2.1.2. Payment method preferences

#### Key take-aways

- Having selected a credit or debit card, or an online banking service in Task 1 leads individuals to be more likely to remain with this type of payment method in Task 2. When display practices influence the choice of payment method, the two most popular destinations of switching were credit or debit card, and online banking.
- The likelihood of selecting the payment method that was suggested in Task 2 is likely dependent on the treatment. For defaulting, credit and debit cards seem to be the most effective at eliciting the most influence on consumer conduct. However, Big Tech wallet users tend to use other Big Tech wallets.
- Upstreaming has more scattered results with Paypal and Big Tech wallets seeming to influence consumers the most. Switching to online banking is rather infrequent even though they tend to be a significant destination, suggesting that online banking services are more often identified with Outcome 2 with them being selected in Task 2 but not through them being suggested.
- For show-more the shares are rather equal across the suggested payment methods, but those who selected credit or debit card, and online banking were least likely to be influenced.

A secondary factor that is likely to be relevant to consumers' decision-making on the choice of payment is the payment methods offered by e-commerce platforms and suggested by the display practices. This may also be a confounding factor as consumers who prefer a certain type of payment method, may have a greater or lesser proclivity to change payment methods when exposed to a display practice. As such, the type of payment method selected in Tasks 1 and 2 were investigated, to determine whether the influence depended on the payment method preferences. The payment method suggested was also included in this analysis to understand the interaction effects between the payment preferences and tasks.

As such, the below tables provide insight on which payment method was selected in Task 2, depending on what was selected in Task 1, and the share of respondents who changed payment methods depending on what was selected in Task 1, which display practice was treated, and the payment method(s) were suggested by the treatment in Task 2.

**Table 2.12: Payment Method Selected in Task 2 Based on Payment Method Selected in Task 1**

		Payment Method Selected in Task 2						
		Credit or debit card	Paypal	Big Tech Wallets	Online banking	Buy now pay later	Other digital wallets	Other
Payment Method Selected in Task 1	Credit or debit card	58.2%	11.8%	4.6%	18.9%	3.5%	2.5%	0.6%
	Paypal	20.8%	46.9%	6.3%	17.9%	5.4%	2.0%	0.7%
	Big Tech Wallets	14.2%	11.7%	43.6%	19.4%	5.8%	4.0%	1.2%
	Online banking	15.3%	11.5%	5.9%	59.4%	6.4%	1.1%	0.4%
	Buy now pay later	13.7%	10.3%	6.4%	22.2%	44.9%	1.8%	0.7%
	Other digital wallets	24.5%	4.7%	9.7%	7.8%	6.1%	46.7%	0.4%
	Other	12.4%	18.5%	12.1%	24.9%	5.1%	0.0%	27.0%

Source: Consumer survey

When looking at the payment methods selected in Task 1 and 2, we see that many respondents select the same method in both Tasks. Nearly 60% of respondents that selected Credit or debit card or Online banking in Task 1, also selected the same payment method in Task 2. As there are multiple types of online banking services available, this also contains those that switched but continued selecting an online banking service. The share of remaining with the payment method type is between 40 and 50% for the other payment types, except for 'Other' for which the share who did not switch was 27%. When changing payment methods, those who selected a credit or debit card, Big Tech wallet, a Buy Now Pay Later service, or other payment method, were most likely to change to an online banking payment method. The respondents who selected Paypal, online banking, or another digital wallet were most likely to change to a credit or debit card.

**Table 2.13: Share of Influence on Respondents Choice of Payment Methods Based on Payment Method Selected in Task 1 and Suggested Method When Exposed to Default**

Payment Method Suggested by Treatment							
	Credit or debit card	Paypal	Big Tech Wallets	Online banking	Buy now pay later	Other digital wallets	Other
Payment Method Selected in Task 1	Credit or debit card	21.8%	20.6%	19.4%	13.3%	9.2%	6.2%
	Paypal	32.9%	21.5%	23.1%	16.9%	12.9%	2.4%
	Big Tech Wallets	17.9%	13.8%	24.4%	16.8%	14.4%	18.9%
	Online banking	31.9%	25.8%	16.6%	22.1%	20.2%	14.0%
	Buy now pay later	44.1%	29.6%	14.8%	21.7%	17.5%	7.5%
	Other digital wallets	22.1%	12.4%	17.1%	19.4%	21.7%	39.4%
	Other	100.0%	0.0%	37.9%	54.7%		

Source: Consumer survey

**Table 2.14: Share of Influence on Respondents Choice of Payment Methods Based on Payment Method Selected in Task 1 and Suggested Method When Exposed to Upstreaming**

Payment Method Suggested by Treatment							
	Credit or debit card	Paypal	Big Tech Wallets	Online banking	Buy now pay later	Other digital wallets	Other
Payment Method Selected in Task 1	Credit or debit card	19.0%	24.0%	15.0%	24.1%	12.4%	14.0%
	Paypal	15.0%	30.7%	19.6%		9.8%	22.8%
	Big Tech Wallets	30.0%	35.9%	32.0%	23.9%	21.0%	34.2%
	Online banking	26.2%	25.9%	20.7%	20.2%	15.0%	5.5%
	Buy now pay later	14.5%	24.3%	26.8%	15.6%	7.5%	8.3%
	Other digital wallets	17.0%	29.2%	17.7%	10.5%	33.1%	
	Other	0.0%	0.0%	69.7%	19.3%	45.1%	0.0%

Source: Consumer survey

**Table 2.15: Share of Influence on Respondents Choice of Payment Methods Based on Payment Method Selected in Task 1 and Suggested Method When Exposed to Show-More**

		Payment Method Suggested by Treatment						
		Credit or debit card	Paypal	Big Tech Wallets	Online banking	Buy now pay later	Other digital wallets	Other
Payment Method Selected in Task 1	Credit or debit card		68.6%	63.7%	67.5%	66.5%	63.9%	53.5%
	Paypal	83.0%		77.2%	79.9%	76.6%	73.0%	69.4%
	Big Tech Wallets	89.7%	91.4%		90.0%	84.4%	86.1%	76.9%
	Online banking	76.8%	77.6%	73.5%		74.7%	79.0%	65.2%
	Buy now pay later	83.3%	87.2%	80.4%	83.0%		96.4%	70.4%
	Other digital wallets	84.2%	80.5%	83.6%	87.9%	78.1%		100.0%
	Other	52.5%	83.6%	65.7%	90.9%	100.0%	100.0%	

Source: Consumer survey

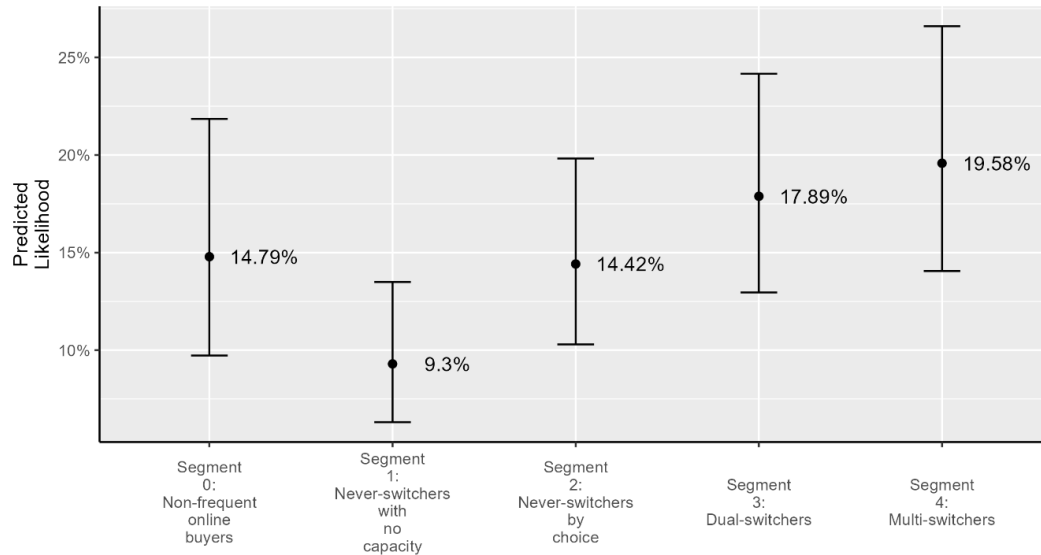
When examining the payment methods suggested by the treatment, additional results are found. When exposed to defaulting, of the respondents who selected credit or debit cards, around 20% changed their selected payment method when suggested Paypal, a Big Tech wallet, or an online banking service. Having selected Paypal, an online banking service, or a Buy Now Pay Later service, respondents were most likely to switch payment methods in Task 2 when being suggested a credit or debit card. Interestingly, for defaulting, the suggested payment method inducing the most change in payment methods between tasks when having selected a Big Tech wallet in Task 1, were other Big Tech wallets. Overall, the payment method influencing payment method selection the most seems to be credit and debit cards.

When looking at upstreaming, the results become more scattered. Buy Now Pay Later services and Big Tech wallets seem to induce switching for those having selected credit or debit cards, and suggesting Big Tech wallets seem to make Paypal users deviate from their payment method. The same relationship also exists in the inverse as those who selected Big Tech wallets in Task 1, were most likely to change payment methods when upstreamed Paypal. Contrary to defaulting, the payment methods influencing payment method selection the most seem to be Paypal and Big Tech wallets.

As we are looking at Outcome 1, we know that the shares represented for defaulting and upstreaming directly indicate how many respondents changed payment methods to the one suggested by the display practice. For show-more however, switching considers any of the three suggested methods and thus we see little variation across the suggested payment methods. However, we do see that on average, those who selected credit or debit card, and online banking were least likely to have changed payment methods, which roughly correlates to the results from Table 2.12.

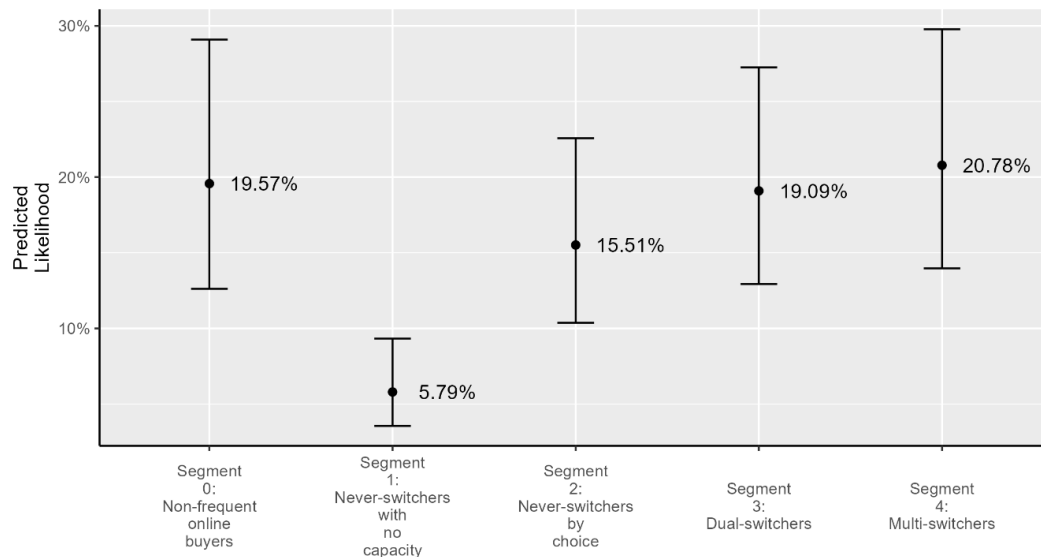
### 2.3.2.1.3. Persona effects on the given offer

**Figure 2.51: Persona effects on the predicted likelihood of changing payment method recommended by treatment**



Source: Consumer survey

**Figure 2.52: Persona effects on the predicted likelihood of changing payment method not recommended by treatment**



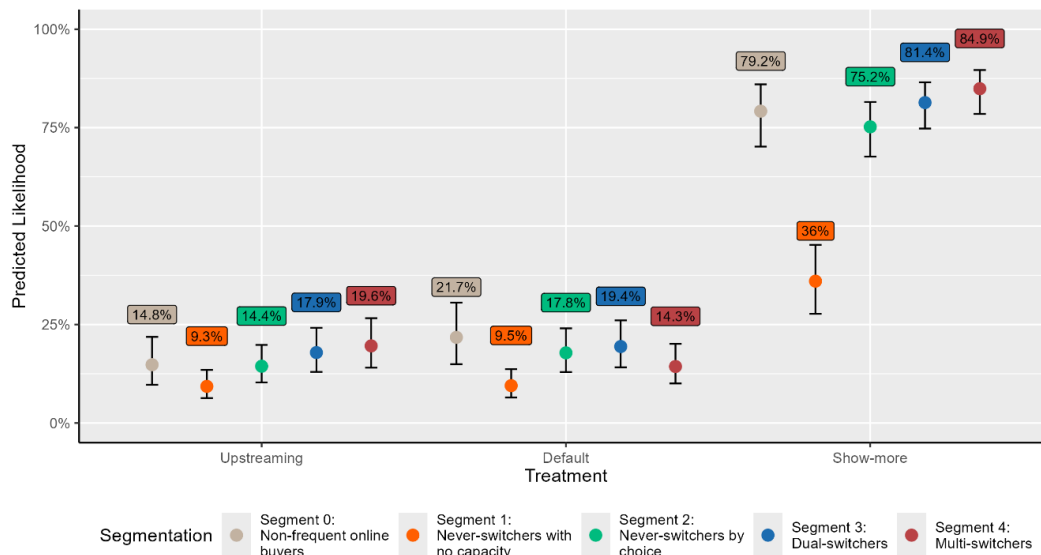
Source: Consumer survey

The experiment shows that inherent ownership of payment methods has a strong impact on whether or not an individual can be swayed by a display practice. Indeed, in accordance with their personas, individuals with more than two frequently used payment methods (multi switchers) were more likely to change payment methods in the experiment than all other personas. Additionally, those with only one payment method (Never-switchers with no capacity) are the least likely to switch. They still have a predicted likelihood of 9% because the personas are not exact and still may have clicked

on the option to sign up for a new payment method. A similar pattern emerges between the predicted likelihood of changing to a method recommended vs. one not recommended by the treatment.

Delving more deeply into differences across specific treatments, we see further differences in the effect of persona.

**Figure 2.53: Persona effects on predicted likelihood to change payment per individual treatment**



Source: Consumer survey

We find a substantial difference in the effect of persona on changing payment methods between tasks for show-more. Here, never-switchers with no capacity have a 40% to 50% lower predicted likelihood to switch than all other personas. This difference is relatively larger than when we combine all treatments effects together.

The results for up-streaming mirror those found when we combine all treatments: Multi-switchers are approximately twice as likely to change payment methods than never-switchers with no capacity. For the default treatment, however, we see that multi-switchers are relatively less likely to change payment method compared to upstreaming and show-more.

### 2.3.2.2. E-commerce platform effects

Within the factors that directly shape consumer decision-making in terms of payment methods, the e-commerce platform used can be a decisive factor. Before even reaching the point of choosing a payment option, consumers must first select an e-commerce platform that offers the product or service they are looking for and then navigate its interface to complete the purchase. Additionally, e-commerce platforms actively shape payment behaviour by determining which payment methods are available and how they are presented. Using one e-commerce platform over another can therefore directly influence the payment method ultimately chosen.

This subsection explores the key e-commerce platform-related factors that come into play and can be grouped into 3 distinct sub-categories: e-commerce platform preferences, price effect and device type effect.

**Figure 2.54: Platform effects**

*Source: Project Team elaboration*

#### **2.3.2.2.1. E-commerce platform preference**

##### **Key take-aways**

- Payment method availability acts as a stronger determinant of purchasing behaviour than the reputation or trustworthiness of a given e-commerce platform. When a payment method is strategically promoted consumers who trust a platform are more likely to follow that recommendation. If the platform does not guide, consumers do not diverge from usual preferences.
- Trust and familiarity shape e-commerce platform preferences with 68% of respondents avoiding unfamiliar e-commerce platforms, and those who distrust e-commerce platforms resisting to change to platform-recommended payment methods.
- Payment method preference outweighs e-commerce platform loyalty, as 74% of respondents would abandon a familiar e-commerce platform if their preferred payment method was unavailable.
- Security (78%), reputation (74%), speed and efficiency (73%) and familiarity (72%) are the most considered e-commerce platform features. Those considering these features are more likely to change payment method when the e-commerce platform recommends a payment method but not otherwise.

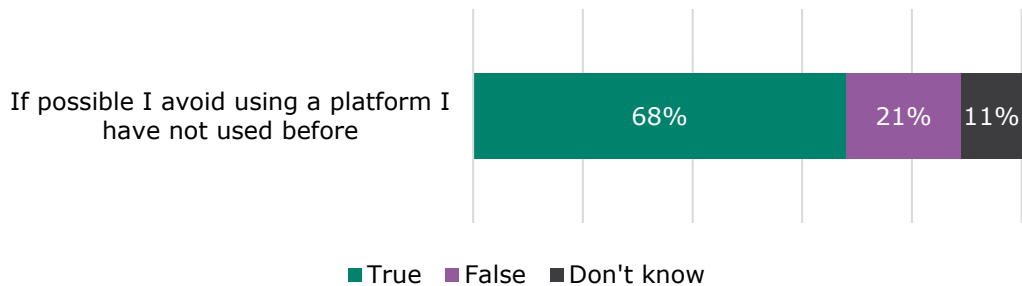
In some cases, the choice of an e-commerce platform is predetermined, i.e., consumers must purchase a specific product through a dedicated e-commerce platform. However, in many other cases, consumers can have multiple e-commerce platforms to choose from when purchasing the same good or service. In these scenarios, e-commerce platform preference plays a key role in shaping consumer behaviour, not only in terms of where they shop but also in how they pay. By choosing one e-commerce platform over another, consumers are often led to specific payment methods based on what the e-commerce platform offers and how those options are presented.

Based on the evidence collected in the literature review, one of the strongest factors shaping e-commerce platform preference is individual perceptions of control over the purchase, which are shaped by previous experience with the e-commerce platform, familiarity with its features, and its reputation. These factors contribute to perceived

security and trust, critical determinants in both e-commerce platform and payment method selection. When given a choice between multiple e-commerce platforms, 68% of survey respondents prefer to use an e-commerce platform they have already used in the past, reinforcing the importance of familiarity and prior experience.

**Figure 2.55: Impact of familiarity on e-commerce platform preference**

G5. In your opinion, which of the following statements are true or false? (N=11532)

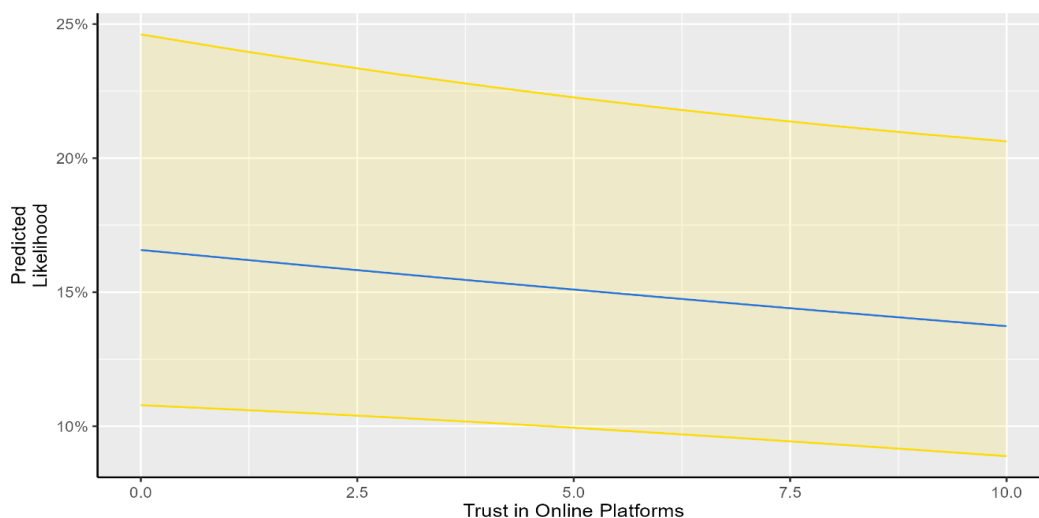


Source: Consumer survey

General trust in online platforms also plays a role in determining whether consumers are willing to switch payment methods based on e-commerce platform recommendations. Notably, general trust in e-commerce platforms is negatively correlated with the likelihood of changing to a payment method recommended by the e-commerce platform. In other words, when the specific features of the e-commerce platform are not considered, those who generally trust e-commerce platforms are less likely to change to the one suggested by the platform.

The graph below shows the results of the regression analysis on the predicted likelihood of changing to a treatment payment method based on general e-commerce platform trust.

**Figure 2.56: Impact of e-commerce platform trust on the likelihood of changing payment method based on treatment recommendation**

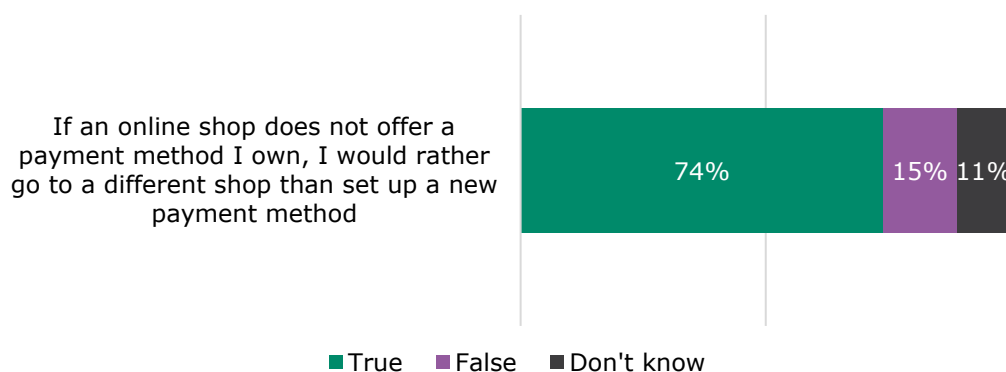


Source: Consumer survey

To understand the relative importance of payment method availability versus e-commerce platform choice, we examined whether consumers were more inclined to switch e-commerce platforms or adopt a new payment method when their preferred payment option was unavailable. Indeed, 74% of respondents state that they would switch e-commerce platforms if their current one does not support their preferred payment method. The findings show that, in general, consumers place higher importance on their ability to use a familiar payment method than on remaining loyal to a specific e-commerce platform. Thus, payment method availability acts as a stronger determinant of purchasing behaviour than the reputation or trustworthiness of a given e-commerce platform.

**Figure 2.57: Impact of payment method availability on platform choice**

G5. In your opinion, which of the following statements are true or false? (N=11532)



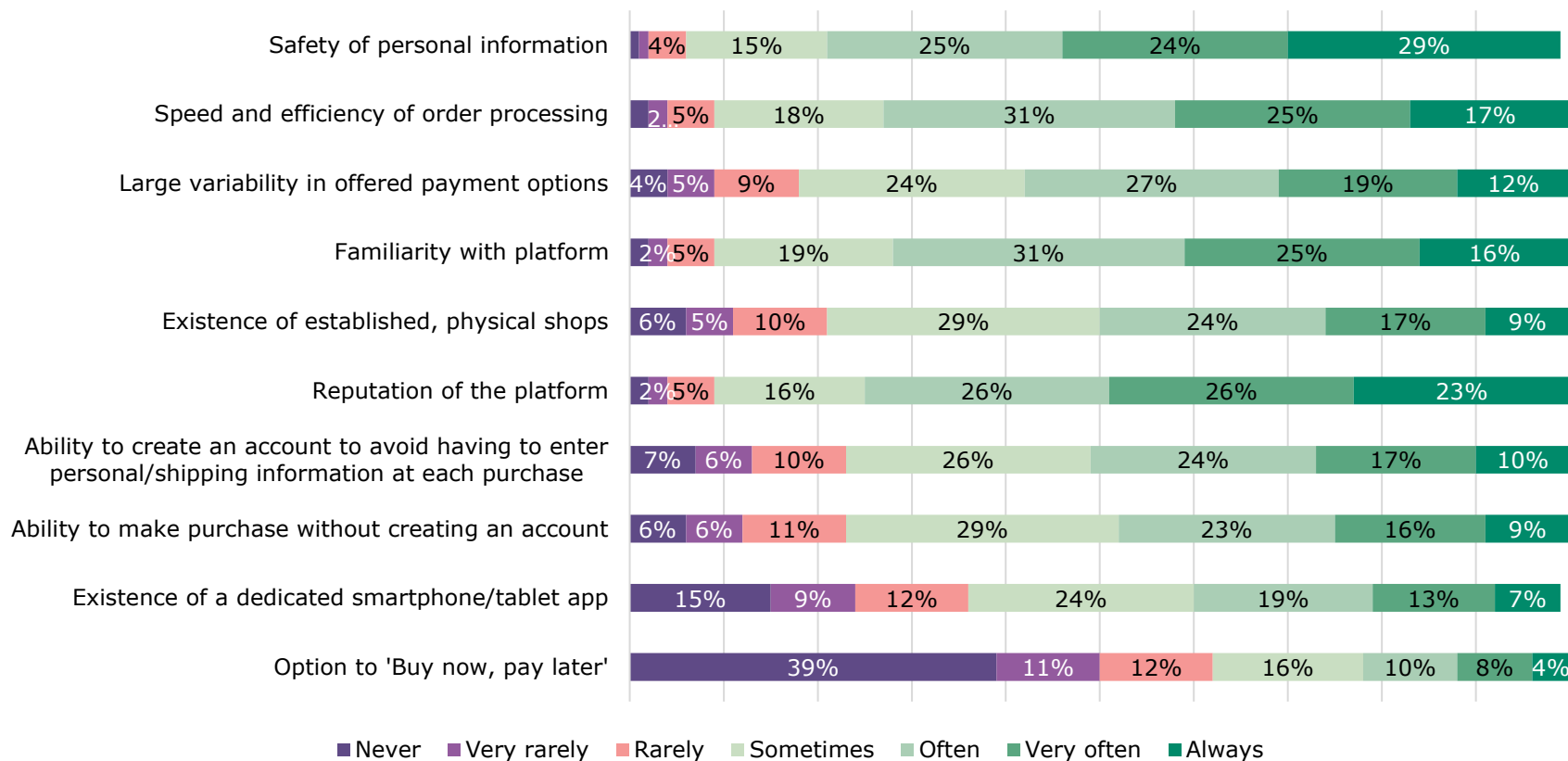
Source: Consumer survey

Beyond general e-commerce platform preference, specific e-commerce platform features play a role in shaping consumers behaviour. When analysing which e-commerce platform features matter the most to consumers, the most frequently considered aspects are the safety of personal information (78%), followed by the reputation of the e-commerce platform (75%), speed and efficiency (73%), and familiarity with the e-commerce platform (72%).

Despite not being among the top 4 most considered aspects, almost 6 sur 10 respondents take into account the large variability in offered payment options (58%) when considering e-commerce platform features, highlighting again its importance.

**Figure 2.58: Key platform features influencing consumer behaviour**

G4. Think about the online shopping platforms you have recently used. How often did you consider the following features? (n=11532)

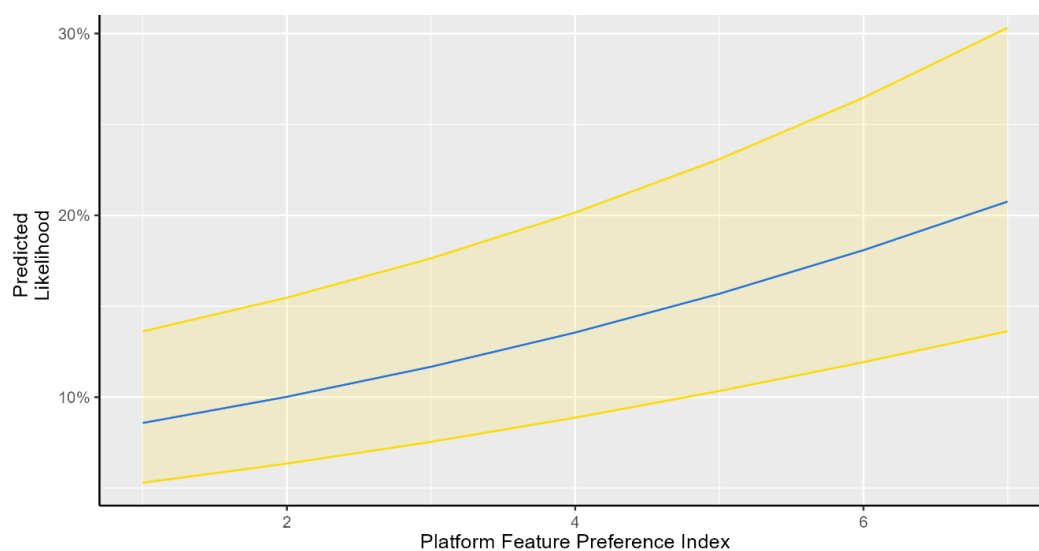


Source: Consumer survey

To further explore this relationship, the study constructed a 'Platform Features Preference Index', i.e., a measure that captures the average importance consumers assign to these e-commerce platform attributes<sup>130</sup>. This index was examined in relation to the likelihood of switching to a payment method presented through a display practice, such as a default option. The positive significance of this relationship suggests that the more consumers take e-commerce platform features into account, the more likely they are to switch payment methods when prompted by the e-commerce platform. This highlights the role of e-commerce platform trust, familiarity, and the possibility to choose between different payment options in shaping payment decisions. Consumers who prioritise security, reputation, speed, or the availability of multiple payment options, are more susceptible to switching payment methods when one is recommended by the platform. When consumers have several payment methods to choose from, they are more likely to consider alternatives. If an e-commerce platform recommends a specific method, users may be more open to switching because they already perceive payments as a flexible choice. In contrast, when payment options are limited, consumers tend to stick with what they know (if available), as there are fewer opportunities or incentives to switch.

Additionally, if an e-commerce platform is perceived as secure and reputable, consumers may be more willing to trust the payment method it promotes, even if it differs from their usual choice. Similarly, if an e-commerce platform is known for speed and efficiency, users may be inclined to adopt a payment method that is seamlessly integrated into the checkout process, particularly if it appears as a default or prominently displayed option. The graph below shows the predicted likelihood of switching to a recommended payment method based on the Platform Features Preference Index.

**Figure 2.59: Impact of platform feature preference index on the likelihood of changing payment method based on treatment recommendation**



Source: Consumer survey

<sup>130</sup> Platform features include: safety of personal information; speed and efficiency of order processing; large variability in offered payment options; familiarity with platform; existence of established; physical shops; reputation of platform; ability to create an account to avoid having to enter personal/shipping information at each purchase; ability to make purchase without creating an account; existence of a dedicated smartphone/tablet app; option to 'buy now, pay later';.

This relationship does not hold when looking at the likelihood of selecting a different payment method regardless of the display practices. The Platform Features Preference Index is not significant for this outcome, meaning that when the platform does not actively suggest or promote a specific payment method, the importance consumers place on platform features does not significantly impact their likelihood of switching. In other words, consumers who highly value platform attributes such as security, reputation, familiarity, and a large variability of payment options, are not inherently more likely to switch payment methods unless the platform itself plays a guiding role in that decision.

This suggests that the effect of e-commerce platform preference on payment method selection is contingent on how payment options are presented. When a payment method is strategically promoted—such as being set as a default — consumers who trust and engage with the platform’s features are more likely to follow that recommendation.

#### **2.3.2.2.2. Price and complexity of purchase**

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##### **Key take-aways**

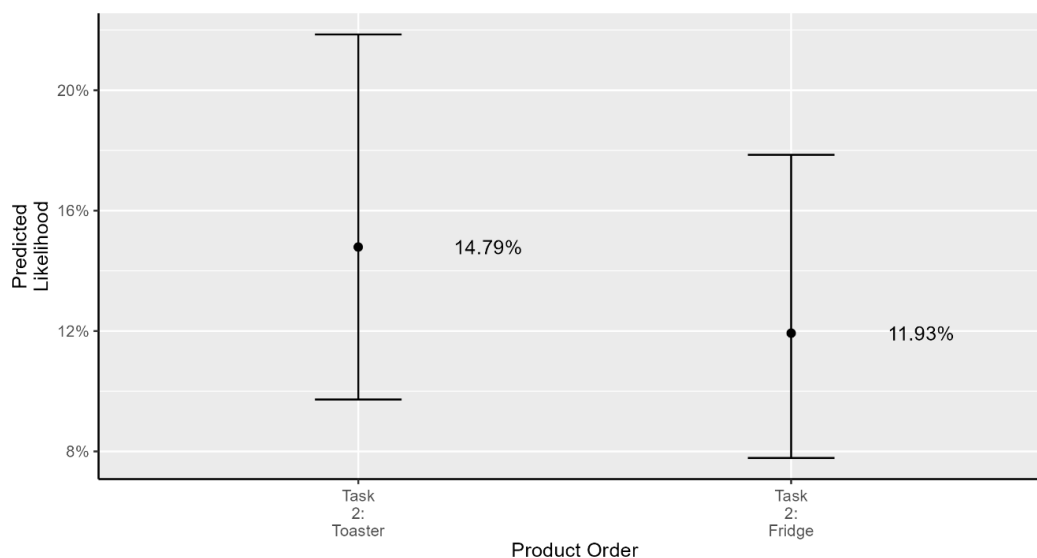
- Product price/type has been found to have a significant effect on individual’s likelihood to switch payment method when exposed to a practice. Products with higher prices (300 euros VS 30 euros) reduce the likelihood of switching to the payment method recommended by the display practice, lowering the probability by approximately 3%. This effect relates to price differences between products, not variation in price for the same product across different online shops.
  - Respondents are less likely to select the payment option recommended by the display practice when the product is a fridge for upstreaming and default. No such effect exists for show-more, which seems to nullify any price effect as even if more attention is placed for more expensive products, a respondent is still unlikely to select an option outside of the three proposed by the practice.
  - When exposed to default option, respondents selected payment methods positioned higher (more prominently) on the payment list when purchasing fridges compared to toasters. No other display practice had a significant difference between products.
- 

Price of purchase is another influencing factor. The cost of the product or service being purchased can shape how consumers evaluate and select their payment methods, particularly in terms of perceived security. To better understand the price effect on changing payment method, the experiment included two distinct purchasing scenarios: one involving a higher-priced product (fridge) and the other a lower-priced product (toaster).

The rationale behind this distinction is that price sensitivity can impact payment decisions in multiple ways. For higher-priced items, consumers may be more cautious, prioritising payment methods they perceive as more secure or that are more familiar to them. Conversely, for lower-priced products, convenience and speed may take precedence, making consumers more likely to opt for familiar or platform-recommended payment options.

When looking at the effect of product price on the likelihood of changing to the payment method to one recommended by the platform, we observe that as the price increases, the likelihood of switching to the treatment payment method decreases, as shown in the graph below.

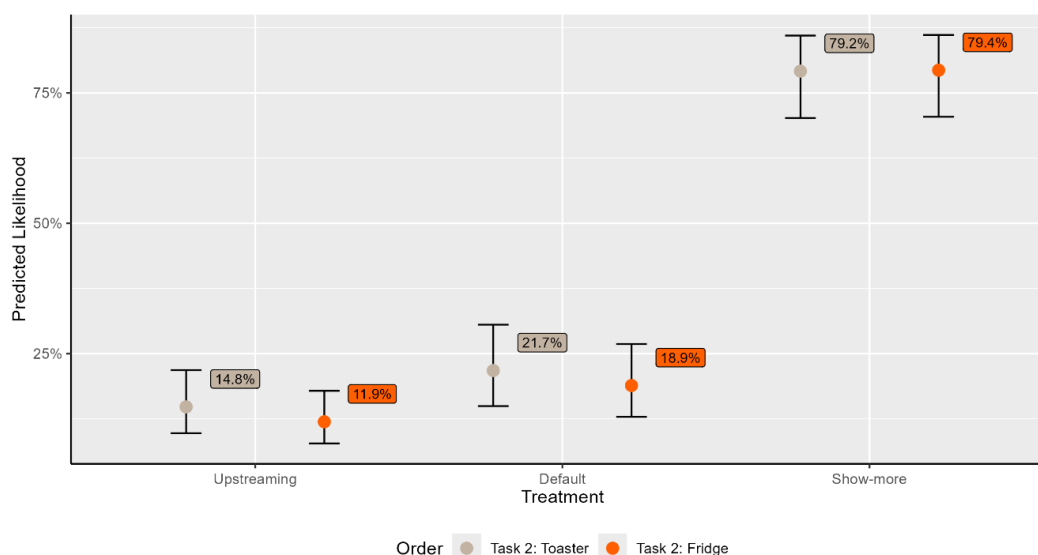
**Figure 2.60: Price effect on the likelihood of changing payment method based on treatment recommendation**



Source: Consumer survey

Further, the study investigated the effect of display practice in combination with the order of the product shown. The results largely coincide with those of the display practice. The graph below shows the predicted likelihood to change payment methods to the treated option in Decision Task 2.

**Figure 2.61: Display practice and price effect on the likelihood of changing payment method based on treatment recommendation**



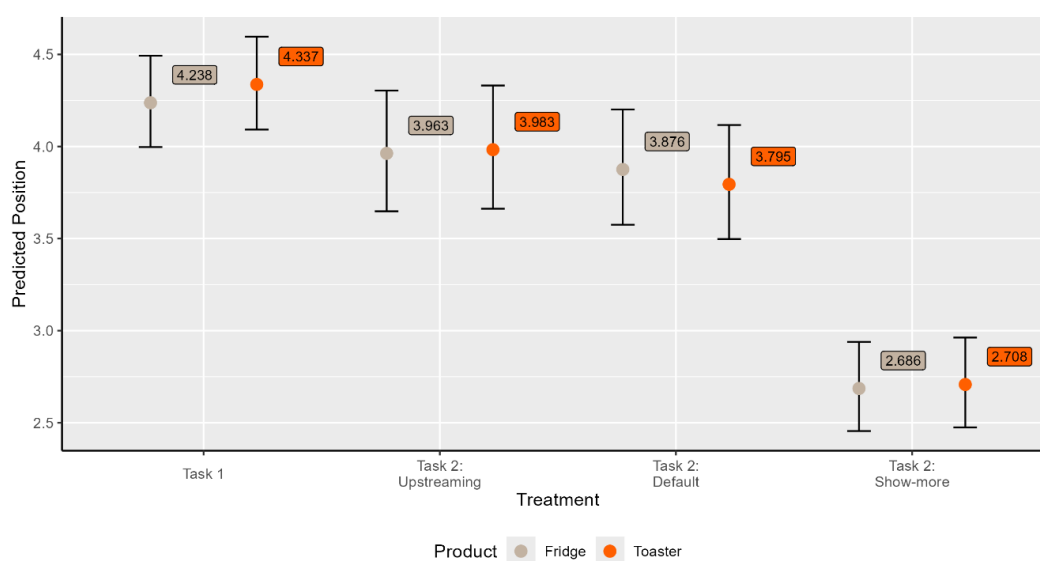
Source: Consumer survey

It seems that when the purchased product is the fridge, they are less likely to select the 'upstreamed' or 'defaulted' payment option than if it is with the toaster. This follows the logic that more attention is placed on the task when the product being purchased is more expensive. This difference is not identified for show-more. However, this does not necessarily mean that consumers do not pay attention to price in the show-more environment. Instead, the show-more display practice may neutralise any price effects as

even when one places more attention to a higher priced good and is conscious that their preferred payment option is not shown, one is still likely to find an acceptable payment option and select within the first three options. This interaction effect was also tested for changing to an option not treated by the display practice, but this was not found to be significant.

The position at which the payment option was selected was also assessed based on the product shown, the treatment, and the task. While the results mimic those of simply the treatment and task on the position, there are additional product effects that are significant. The below graph shows the predicted position when considering these factors.

**Figure 2.62: Display practice and price effect on the position of selected payment method**



Source: Consumer survey

Whether the product was a fridge or a toaster in Decision Task 1 and for upstreaming should largely not have an effect as the effects of position is mostly lost through the simple position randomisation of users' preferred payment options. Similarly, the effect of show-more is very minimal, again hinting that the price-effect either does not exist, or it is not being observed due to the design of the display practice. Thus, the only display practice in which a product effect may be visible is for default, which is also corroborated by the above graph, where the predicted position of the toaster is higher than that of the fridge, providing credence to the price effect, where greater attention is placed on purchases of products with higher prices.

### 2.3.2.2.3. Device type effects

#### Key take-aways

- Device type is not found to be significant in determining the likelihood of changing to a payment method suggested by the display practice.
- Respondents who prefer using a smartphone for online shopping are slightly more likely (22% vs 20%) to be influenced for the choice of their payment method even when the new option is not explicitly recommended by the platform.

Alongside e-commerce platform preference and price, the device used for online shopping can also influence consumers' payment method choices. This is because consumer

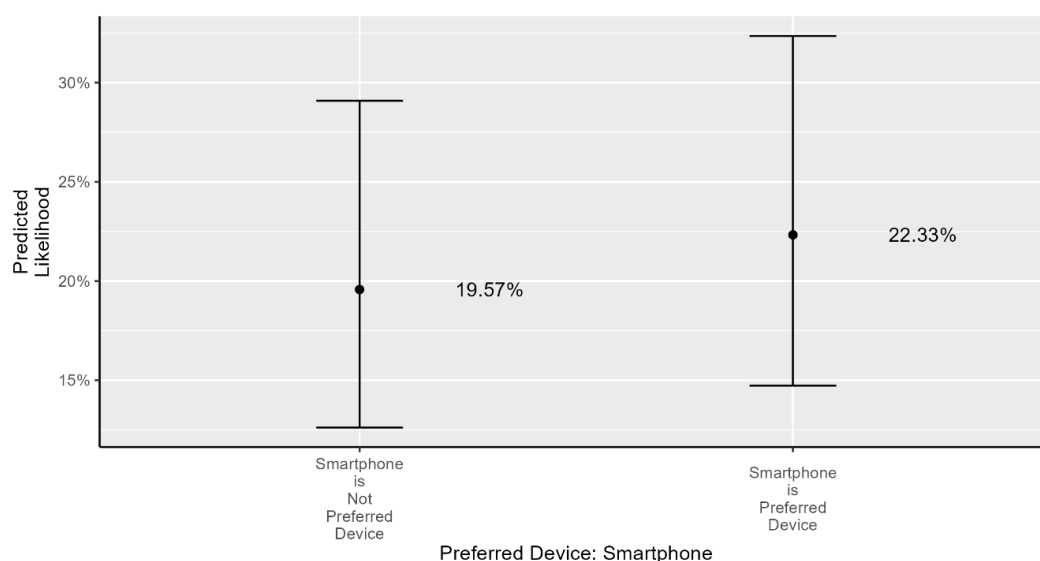
experience and perhaps the way payment options are offered and displayed may vary depending on the device being used.

To confirm whether device does have an effect, we conducted a robustness check on the inclusion of the actual device through which the respondent carried out the survey and experiment within the model. We see no changes to the core regression coefficients and device type is shown to be not significant in determining the likelihood of changing to a payment method suggested by the display practice.

In this analysis, device type was measured based on respondents' preferred device for online shopping rather than the actual device used during the experiment. As a result, device preference was not found to have a significant effect on Outcome 1—switching to a payment method suggested by the display practice. In other words, whether someone prefers shopping on a smartphone, or a desktop did not significantly impact their likelihood of adopting a platform-recommended payment method.

That said, when analysing Outcome 2—switching to a different payment method than the one selected in Decision Task 1, regardless of the display practice—device preference did show a statistically significant effect (see Annex E). Specifically, respondents who prefer using a smartphone for online shopping were more likely to change their payment method even when the new option was not explicitly recommended by the platform.

**Figure 2.63: Smartphone effect on the likelihood of changing to a payment method not suggested by the display practice**



Source: Consumer survey

This result might stem from the convenience-driven nature of mobile shopping. Smartphone users prioritise convenience as a key reason for using their smartphone as seen in the indirect drivers. This flexibility means that mobile shoppers may be less committed to a specific payment method and more inclined to choose whatever option is fastest or most convenient at moment.

### 3. Chapter III: The intensity of competition

Section 1.1 describes the different payment methods available to consumers and to merchants to process online payments.

This chapter builds on such categorization to provide the basis for an assessment of competition in the online payment markets.

In particular, section 3.1 describes the methodology that the Project Team used to assess the intensity of competition, focusing particularly on the activities related to the stakeholder consultation, while section 3.2 identifies the competitive relations between the main players along the value chain (i.e. horizontal and vertical relations), and between the different payment methods.

Finally, section 3.3, discusses the recent evolution in the market, highlighting the most notable trends in the period 2018-2022 across all the selected countries and their drivers.

#### 3.1. Methodology for the analysis of competition

The goal of this section is to provide greater detail on the methodology used by the Project Team to assess the intensity of competition in the online payments sector.

Specifically, a multifaceted approach was used seeking to combine all the resources available to the Project Team.

Additionally, a thorough discussion will be provided on how the stakeholders to be contacted for the stakeholder consultation were selected, and how the efforts made by the Project Team ensured that, despite a low response rate for the merchant questionnaire, the necessary information was collected to identify the dynamics of competition in the online payments sector.

As discussed above, the competitive assessment is based on a combination of methodologies and sources of information:

- data analysis provides the basis to assess the intensity of competition in the online payment markets and the evolution of the shares of online transactions of the main providers of payment methods in the period 2018-2022 in the following countries: Austria, Czechia, Denmark, Germany, Greece, France, Hungary, Italy, Latvia, The Netherlands, Poland, Portugal, Spain and Sweden.
- stakeholder consultation targeting the most relevant market participants, and namely ICS, Big Techs, digital wallets, PIS and providers of payment service particularly relevant in their domestic countries, and ultimately merchants and banks. The stakeholder consultation aimed at obtaining a representative market overview of the competitive landscape in the online payment sector. The stakeholder consultation relied on both online questionnaires and targeted interviews. It represented an iterative process which lasted the entire duration of the project to make sure the perspectives of the main stakeholders of the online payment sectors were covered and accurately grasped. The consultation has been structured as follows:
  - first, the Project Team has arranged interviews with five industry associations – covering both merchants and providers of payment services – to better understand the parameters of competition in the online payment sectors, the barriers operators may face when entering such sectors and expanding in such sectors. Scoping interviews have been crucial to ensure the design of the questionnaire was such to elicit indication of potential competitive hurdles in the online payment sector. In this phase, the Project Team has interviewed five industry associations.

- second, the Project Team sent online questionnaires to merchants, providers of payment applications (including Big Techs, Paypal and other local digital wallets, A2A service providers, PSP), card schemes (including both ICS and domestic schemes). Overall, the questionnaires have been sent to 256 market participants. The online questionnaires will be described in detail in Annex G;
  - third, the Project Team conducted targeted interviews to specific stakeholders. The interviews have been key to uncover the perspective of stakeholders that contributed only to a minor extent to the questionnaire (e.g. domestic schemes) but also to obtain further clarifications from the respondents to the questionnaire. In this phase, interviews were conducted with various categories of industry stakeholders, and in particular an issuing bank, two digital wallet providers, a domestic card scheme and two industry associations.
  - fourth, the Project Team got in contact with some stakeholders to get written clarifications to the responses provided.
- the consumer survey organized by the Project Team has allowed to gather information on the habits, preferences, and behaviours of 11,532 respondents from Austria, Czechia, Denmark, Germany, Greece, France, Hungary, Italy, Latvia, The Netherlands, Poland, Portugal, Spain and Sweden;
  - the behavioural experiment helped to shed light on the ability of merchants to steer consumers' choices through display practices;
  - finally, desk research was an essential tool to understand the complexities of the online payment markets and corroborate and/or clarify the understanding obtained from market participants. The insights gathered through the stakeholder consultation, being based on the subjective opinions of the interviewees, were verified, to the extent possible, with desk research (and quantitative data). Desk research also included antitrust proceedings in various jurisdictions including those outside the EEA.

The remainder of this section is dedicated to describing our approach to the stakeholder consultation. We will refer to the consultation throughout chapters 3 and 4 to support our considerations on the drivers of competition in online payments and the potential sources of competitive concerns.

### **3.1.1. Stakeholders' engagement**

The stakeholder consultations were designed to complement publicly available information, data analysis and desk research by gathering comprehensive insights from a diverse range of players involved in the online payment services sector.

The Project Team drafted three different online questionnaires targeted at three categories of stakeholders: (i) online merchants, (ii) providers of payment applications which, according to our taxonomy, include digital wallets, account-to-account payment solution including payment initiation services, (iii) card schemes.

In some cases, a preliminary analysis of the results led the Project Team to reach out to stakeholders and ask for written clarifications of the responses or online interviews. This approach allowed the Project Team to gather additional information that foster the interpretation of the online questionnaire results.

Below are described the categories of stakeholders that have been engaged throughout the entire duration of the project and the contribution received.

### **3.1.1.1. Online merchants**

Online merchants are the recipients of funds (the payee) in online transactions from consumers to businesses. Merchants play a key competitive role since their choices can affect which payment methods prevail in the market: their perspectives on payment preferences and their drivers, including costs and consumer preferences, are thus essential for a comprehensive market analysis.

The Project Team aimed to collect views of online merchants of various size, and active in several national markets and sectors of economic activity. To reach this scope two associations of online merchants were involved. The Project Team also attempted to contact two additional associations which unfortunately declined the invitation to contribute to the dissemination of the consultation. Given the difficulties in collecting feedback from e-merchants, the Project Team attempted to directly contact 90 merchants considered particularly relevant due to their sales volumes.<sup>131</sup> To ensure representation of smaller e-merchants, a sample of 62 merchants with a turnover between 33 billion and 88000 euros was subsequently built. The selected merchants came from 10 different countries and was contacted again by the Project Team. Lastly to further increase the number of responses an additional sample of 50 merchants from nine different countries, and with turnover ranging from 27 billion and 63 million euros was built and contacted by the Project Team.

Overall, the Project Team engaged with 202 online merchants, and three merchants' associations.<sup>132</sup>

### **3.1.1.2. Card schemes**

Card schemes form the backbone of card-based payment transactions by offering rules, practices, and guidelines for the execution of card-based payment transactions. The Project Team tried to get in contact with both domestic and international card schemes active in the EEA.

One ICS decided to provide only a partial reply to our questionnaire and submitted a written contribution explaining the reasons for the lack of responses. Similarly, another ICS preferred to submit a written contribution, offering its perspective on the ongoing changes in the payments market, particularly in relation to new competitors and regulatory developments. Based on the responses received further clarifications were requested on certain topics covered by the questionnaire, which had been only marginally addressed in their written contributions. The companies subsequently provided additional clarifications on these aspects.

The perspectives of the domestic scheme of one of the selected countries about relevant changes the payment sector is experiencing was gathered during a direct interview.

Overall, the Project Team engaged with 14 card schemes and 1 relevant association.

### **3.1.1.3. Providers of payment applications**

Based on our taxonomy (see chapter 1 and in particular section 1.1) payment applications include digital wallets, account-to-account payment solution including payment initiation services, payment service providers and potentially hybrid solutions. Some of these also

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<sup>131</sup> The list of merchants was identified starting from the list of 124 merchants used to assess the availability rate of the most used payment methods in Chapter 1. This ensured that the list of merchants we attempted to contact included at least four active operators in each of the selected countries.

<sup>132</sup> Of these, two are active at the European level while one operates at the national level.

offer the possibility to buy now and pay later (BNPL). In addition, some of these players are regulated as Payment Institutions, while others are only technical service providers. The targets of this questionnaire, therefore, were very heterogeneous in nature and may offer very different perspectives on the online payment market.

Overall, the Project Team engaged with 40 providers of payment applications, of which 8 Big Techs and 3 industry associations.

Two Big Techs were targeted with tailored questions and encouraged to submit at least a written contribution covering issues that they deem relevant for the purpose of this study. Both ultimately declined to contribute.

In addition, through targeted interviews, the views of one domestic account-to-account operator and one Big Tech were collected. To better clarify some of the responses provided in the questionnaire, an interview was organized also with the representative of a domestic digital wallet provider. Moreover, the Project Team gathered insights through interviews with associations that included providers of payment applications.

Excluding the already mentioned Big Tech companies, the Project Team attempted to contact 32 providers across the EEA. Additionally, some industry associations also contributed to the dissemination of the questionnaires and encouraged their members to participate in the consultation. Finally, two domestic providers were targeted with tailored questions and encouraged to submit at least a written contribution covering issues that they deem relevant for the purpose of this study but no additional details have been provided.

Overall, the Project Team engaged with 40 providers of payment applications, of which 8 Big Techs and 3 industry associations.

#### **3.1.1.4. Others**

The Project Team also gathered the views of a key stakeholder in the online payments sector, the banks, through interviews with associations mainly composed of banks as well as one European issuing bank; one additional issuing bank contributed to the study using the questionnaire intended for card schemes.

These further contributions helped shed light on the functioning of wallets, account-to-account solutions, and the challenges faced by domestic schemes, corroborating the evidence provided by other stakeholders.

#### **3.1.2. Stakeholders that contributed to the consultation**

While the Project Team has relied on multiple channels to engage with stakeholders, and get in contact with more than 200 stakeholders, contributions both in the forms of responses to the questionnaire and interviews – were received from 41 stakeholders and 7 industry associations. Table 3.1 summarizes the number of respondents by category. For a more detailed description of the questionnaire structure and the characteristics of the respondents, see Annex G. At the initial stage of the stakeholder consultation, respondents were able to contribute to the questionnaire anonymously. For this reason, identity data (e.g., the name of the organisation) have not been collected for 7 merchants, 4 providers of payment applications and 1 card scheme.<sup>133</sup>

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<sup>133</sup> These stakeholders, whose identities are not known even to the Project Team, will be referred to as anonymous in the following sections.

**Table 3.1: Contributors<sup>134</sup>**

	<b>Merchants</b>	<b>Card schemes</b>	<b>Providers of Payment applications</b>	<b>Other</b>	<b>Total</b>
<b>Stakeholders</b>	18 (including 17 registered in the EEA and 1 in Switzerland)	6 (including 2 international and 4 domestic)	15 (including 1 Big Tech)	2 issuing banks	41
Through questionnaires	18	4	13	1	36
Through direct interview	1	1	2	1	5
Through written contributions	0	2	0	0	2
<b>Associations</b>	2	1	3	1	7

*Source: Stakeholder consultation*

Despite the limited number of responses to the stakeholder consultation, the multifaceted approach pursued by the Project Team – which triangulates different sources including data, industry reports, antitrust proceedings in other jurisdictions, and consumer survey – allows to identify the main competition dynamics in the online payment sector and uncover potential competitive hurdles.

Additionally, the stakeholders who effectively contributed to the consultation allows to cover the main interest at stake in the online payment sectors:

- **Merchants:** respondents include small-sized, medium-sized and large-sized merchants, including marketplaces, and cover different economic sectors of activity. Some respondents are active in numerous EEA countries and multiple selected countries. Two of the associations contacted are active at the European Union level, while one is active only in one of the selected countries.
- **Card schemes:** respondents include two of the main ICS and four domestic card schemes.
- **Providers of payment applications:** respondents include one Big Tech, some established and international digital wallets and local players. The payment methods involved cover all the categories analysed, such as staged digital wallets, PIS, pass-through digital wallets, payment gateways, and PISPs. Moreover, the share of online transaction provided by Capgemini allowed for coverage of all the major operators across the selected countries.
- **Issuing banks:** banks are a key player in the payment sector with which, inevitably, all the main players must interface. Although they were not the subject of a specific questionnaire, their contributions have allowed us to broaden our understanding of their relationships with other stakeholders.

<sup>134</sup> Please note that some stakeholders contributed in different ways. For example, one merchant contributed both through a direct interview and fulfilling the questionnaire.

## 3.2. Analysis of competitive dynamics

### Key take-aways

The evidence gathered by the Project Team suggests that it exists a high level of heterogeneity in the ability of market players to exert a competitive constraint on one another.

- On the demand side, merchants aim to cater to different consumer preferences while also minimising costs. Contractual arrangements with payment method providers may encourage merchants to steer consumer choices toward options that are more economically advantageous for them. The behavioural experiment conducted by the Project Team suggests that merchants could potentially leverage display practice to influence the selection of payment method. However, consumer survey results also reveal online shoppers are reluctant to register for new payment methods. Additionally, while they may own multiple payment methods, most of them frequently use no more than two. This may lead merchants to accept multiple payment methods to cater to different consumers preferences. Respondents to the questionnaire for merchants indicated that, on average, they accept nearly eight payment methods.
- On the supply side, the stakeholder consultation reveals that providers of different payment methods and/or relying on different payment services perceive each other as close competitors. However, there are also some indications that there are factors – such as difficulties to expand cross border merchants' acceptance and brand recognition, integration to different payment services – which may hinder the ability of a provider to switch from one payment method to another. To the extent different payments methods cater to different consumer (and merchant) needs, such factors could introduce some friction into supply substitutability.

The main takeaway from this discussion is that the competitive relationships among different payment methods are complex. Caution is therefore necessary when defining the perimeter of the relevant market in the online payment sector, and a flexible approach may be more appropriate. The technical and functional characteristics of a payment method could serve as a starting point for the assessment, which should ultimately be supported by an examination of consumer preferences, merchants' costs, and technological innovation in this rapidly evolving sector. In line with consolidated principles of relevant market definition, an assessment of demand-side and supply-side substitutability is required.

For this study, chapter 1 has defined a payment method as the combination of different elements, which serve as complements to one another to allow the online transaction to take place. A payment method is composed by the combination of three or more of such elements:

- a payment instrument/device (i.e. desktop, tablet, smartphone, wearable, staged wallet);
- a payment application (i.e. digital wallets, online banking, PIS);
- a payment service (i.e card payment, credit transfer, direct debit, instant payment, e-money);
- the payment cycle, namely the time in which the effective transfer of funds from the payer to the payee takes place (i.e. regular payment, BNPL, cash on delivery).

Within each of the above elements, there are inputs which serve the same purpose in an online transaction: e.g. the actual transfer of funds in a payment process can be made through cards or through credit transfers. The relationship across elements identifies

instead complementary inputs: cards and digital wallet applications are complementary inputs to provide online payments.

Essential inputs to all types of non-cash payments are the payment services. Payment services constitute the necessary payment infrastructure to perform any online transaction since they perform the core function of transferring funds from the payers' bank account to the payees' bank account. Banks and card schemes play a pivotal role in this sector as they are involved in building and maintaining some of these necessary infrastructures.

Payment applications, for example digital wallets, enable the transfer of funds from the payer to the payee by relying on a specific payment service (e.g. direct debit, card payments). Providers of payment applications include digital wallet providers, and operators active in the online banking space, i.e. traditional financial institutions providing electronic banking services and PIS.<sup>135</sup>

Providers of payment applications can therefore differ from one another *inter alia* based on the type of payment service used; for example, digital wallets such as Google Pay and Apple Pay are card-based wallets, while Bizum is a PIS which relies on credit transfers. Providers of payment applications can also employ multiple payment services. For example, Paypal is a staged digital wallet which allows to upload card-based applications and make card-based payments, as well as to perform electronic money transactions, and to directly link the consumer's bank account to the wallet and pay through direct debits.

It follows from the above that the relationships between providers of payment methods can be of horizontal and/or of vertical nature. Card schemes, for example, may provide an input to digital wallets, while being available alongside them at the check-out page of e-commerce platforms.

From the consumer's perspective, the different payment methods – i.e. the combinations of the factors described above – constitute the options available at the check-out page to make the online purchase. These methods represent the alternatives consumers can choose from to finalize their transactions. Similarly, for merchants, the different payment methods provide distinct ways to accept online payments.

Each payment method may cater to different needs for both merchants and consumers. Looking at broad aggregates may hide the actual competitive strength of certain market players and, possibly, competitive hurdles. Therefore, it is important to identify potentially relevant segmentations of the market. In line with consolidated principles of relevant market definition, this exercise entails an assessment of demand-side and supply-side substitutability.

Payment methods are two-sided platforms, and their demand is represented by two different groups of economic agents: consumers and merchants. To effectively assess the competitive relations among the providers of different payment methods, their evolution over time, and the existence of potential competitive hurdles in the market, the starting point should therefore be the determinants of merchants' and consumers' demand for such payment methods, i.e. what drives merchants and consumers to choose one payment method over another. These are discussed in section 3.2.1.

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<sup>135</sup> For the purpose of this report, PIS is a service that is provided by a third-party payment service provider that allows to initiate a payment order at the request of a payment service user with respect to a payment account held at an account servicing payment service provider. In detail, the following operators are included in the PIS category: MBWay, BancomatPay, NexiPay, iDEAL, Bizum, Swish, Blik, MyBank, ePrzelewy, Paysera, Trustly and Sofort.

The extent to which payment methods compete with one another may also depend on factors that limit the ability of suppliers to provide alternative payment methods: supply-side substitutability among different payment methods is analysed in section 3.2.2.

### **3.2.1. Factors influencing the choice of consumers and merchants**

Given the two-sided nature of payment platforms, the factors influencing the choice of consumers and merchants are likely to be closely intertwined. Online payment methods are indeed characterized by (indirect) network effects: the more consumers use one payment method, the more merchants will be willing to accept it; the more merchants accept a payment method, the more valuable it becomes to consumers that use it.

Consumers' preferences and costs appear to be the main drivers of merchants' demand. Merchants may tailor their acceptance of payment methods to align with consumer preferences, ultimately maximising consumer reach and reducing drop-out rates at checkout. At the same time, cost considerations may lead merchants to steer consumer choices toward payment methods that are more economically advantageous for them. Consumer inertia might also play a role when striking the delicate balance between consumer preferences and costs.

Below we assess (i) the drivers of consumers preferences, (ii) the drivers of merchants' costs and (iii) the role of consumers' inertia for payment methods usage and acceptance.

#### **3.2.1.1. Consumers' preferences and reach of payment methods**

The consumer survey provides an overview of the factors shaping consumers' preferences for online payment methods. Absence of direct transaction costs, security features and reputation of the providers are the most relevant dimensions consumers consider when signing up for a new payment method (Table 3.2).

**Table 3.2: Preferred features in new payment methods<sup>136</sup>**

	<b>Net Approval</b>	<b>Average score<sup>137</sup></b>
Lack of direct transaction fees and other costs	87%	8,19
Security features (e.g., encryption, fraud protection)	87%	8,14
Reputation of the provider	86%	7,95
Ease of monitoring and managing expenses	84%	7,72
Convenience of use (e.g., ease of setup, user interface)	82%	7,56
Acceptance by merchants	82%	7,58
Additional benefits or rewards (e.g., cashback, loyalty points)	73%	6,93
Seamless transactions (e.g., preferred payment methods are saved)	63%	6,27
Usage by people I know	59%	5,88
Possibility to pay in instalments	43%	4,59
Ability to 'BNPL'	41%	4,39

*Source: Consumer Survey*

These are closely followed by ease of use, the ability to monitor and manage expenses, and merchants' acceptance.

The relevance of some of these factors, namely ease of use and security perceptions, tends to increase with usage, thereby reinforcing consumers' preferences for a given payment method, favouring the reputation of the providers and, in turn, merchants' acceptance.

Indeed, the more a consumer uses a payment method, the easier it becomes for them to find it increasingly convenient for making further purchases in their daily life.

Data from the consumer survey allows for a quantitative assessment of whether the perception of security increases with frequent use of a payment method. Consumers were asked to evaluate how well each payment method or application owned guards their personal information from being shared without their consent and how well each payment method owned protects them to losing money due to a fraud or a scam. For 44 out of 49 payments methods, consumers who reported using these methods at least frequently

<sup>136</sup> The survey asked consumers the following question: "Imagine you want to use a new payment method for your online purchases. What factors would you consider in making your decision?" For all the options provided consumer must assign a score between 0 and 10. Net approval refers to the percentage of respondents that rated each feature with a 6 through 10 (extremely important) on a 10-point scale.

<sup>137</sup> Please note that the average score is based on the number of respondents. Therefore, it is not a weighted average that considers the different sizes of the countries in terms of population.

considered them safer against the risk of fraud or scams compared to consumers who reported using them only rarely or occasionally<sup>138</sup>.

Regarding the risk of sharing personal information, this number slightly decreased to 41 out of 49.<sup>139</sup>

The data suggests that as the frequency of use of a payment application increases, consumers' perception of security also increases. While the result could be driven by respondents that, being already convinced that a payment method was secure beforehand, are more likely to confirm it as their payment method, it could also well suggest that the more you use a payment method, the more your perception of its security increases.

The evidence collected through desk research and scoping interviews confirmed that security can be an important determinant of consumers' choice. The demand for security in online purchases has led to the introduction of innovative solutions that could guarantee payment security: tokenization is one such solution. Payment tokenization is the process of replacing sensitive data in a transaction (such as the cardholder's primary account number, or PAN) with non-sensitive equivalents, called "tokens". Tokenization makes it easier for businesses to comply with the PCI framework. The security of payment methods relying on tokenization, e.g. cards and digital wallets, can contribute to their success. It also gives room to the rise of new services in the payment ecosystem, related to the provision and request of token services. There are, industry players who are responsible for generating the tokens (the token service providers – TSPs) and others that take part in the tokenization process since they request the tokens from TSPs. Payment gateways are one example of token requestors and can help merchants comply with the PCI framework. Given that security is a key driver of consumers' preferences for payment methods, ensuring a level playing field between third-party token providers and established players like ICS, which offer integrated token services, is essential for fostering competition based on merit.

### **Box 3.1: Payment tokenisation and the role of payment gateways**

The concept of digital tokens emerged in the early 2000s, and tokenization has since then become widely used for online transactions.<sup>140</sup> Tokenisation could also streamline the checkout process, reducing friction and improving transaction success rates for merchants.

#### **The parties involved**

The TSP is responsible for generating, storing, verifying, and managing payment tokens. Additionally, the TSP maintains a secure mapping between the original PAN and the generated payment token, storing this data in a secure token vault: this information allows the TSP to detokenize the payment token, converting it back into the original PAN. TSPs include global card networks, such as Mastercard and Visa, but also card issuers and third-party payment service providers. Token requestors request the generation of a payment token from a TSP for a given PAN. These requestors are

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<sup>138</sup> The only exceptions are Giropay (152 owners), Incard (8 owners), Luminor (83 owners), Platba 24 online (53 owners), δία 4 (9 owners).

<sup>139</sup> The only exceptions are FIO banka online (68 owners), Incard (8 owners), Luminor (83 owners), MBH Bank (85 owners), Paylib (95 owners), Platba 24 online (53 owners), Trustly (59 owners), δία 4 (9 owners).

<sup>140</sup> See for example [Mastercard Sees Growth in Tokenization, Commercial Payments](#) or [Visa Issues 10 Billionth Token, Generating \\$40 Billion in Incremental E-commerce Globally](#) | Visa.

responsible for managing tokens securely (although the mere token has no value without the additional information stored in the TSP's secure vault that allows to trace it back to the original PAN). A notable example of token service requestors are digital wallet providers, such as Apple Pay or Google Pay.

#### **Use cases of payment tokens**

Tokenisation allows to securely store payment cards' data for future use. Therefore, it is particularly useful for businesses that rely on recurring payments (such as subscriptions).

Digital wallets are one particular use case of payment tokens: when a cardholder wants to upload their payment card in a digital wallet, the wallet provider sends a request to the relevant TSP to enroll the card, which generates a payment token linked to the original PAN and incorporates this token into the digital wallet: consumers will then be able to use their tokenised cards without the need to validate their data each time.

#### **The role of payment gateways**

A payment gateway provides the interface or online payment terminal that encrypts and transmits sensitive payment information securely and facilitates authorization of transactions. It acts as a bridge between consumers, merchants and payment processors, facilitating the exchange of necessary information between these parties. Resorting to third-party (or hosted) payment gateways eliminates the need for merchants to store their customer payment information, thereby reducing their PCI compliance risk.

Hosted gateways are provided by third-party services; customers are redirected to the payment service provider's platform to enter their payment details and complete the transaction, after which they are returned to the merchant website. Self-hosted gateways collect transaction data directly on the business's website. In the latter case, the business is responsible for securely managing payment data and complying with data protection standards, including the PCI DSS.

Many payment gateways offer more than just basic gateway services, having varying degrees of vertical integration, often including payment processing services.

#### **A review of the main payment gateways**

Adyen, a pioneering Dutch company in this sector, functions as a payment gateway, payment processor and merchant acquirer. Similarly, Stripe is an American company that combines the roles of payment gateway and payment processor and has reached a significant position in the EU payment market as well.<sup>141</sup> Paypal offers payment gateway services through its controlled company Braintree in addition to its well-known digital wallet service. Square operates not only as a payment gateway but also as a point-of-sale hardware seller. Worldpay provides full PSP services, including merchant accounts.

*Source: Project Team*

Convenience of certain innovative payment methods may be a particularly important driver of recent changes in the online payments competitive landscape, including the rise of

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<sup>141</sup> Key players in the EU payments landscape, 2024 edition | Deloitte Luxembourg.

mobile payment applications allowing contactless payments for POS purchase<sup>142</sup> or new features such as Face ID or double-click for online payments.

A report commissioned by the ECB to Verian in 2023<sup>143</sup> underlined that payment methods should offer clear advantages over the customers' current options to be widely adopted. Convenience, especially for younger respondents, is a strong potential driver to adopt a new payment method.

Finally, the Project Team collected some further evidence that other factors such as the purpose of the payment or the device used may influence consumers' choice of the payment method:

- consumer preferences may vary depending on the transaction values. For example, a national association of merchants noted, during a scoping interview, that in transactions that involve higher value payments – as it is in the case of the fashion industry or the travel industry – some consumers prefer to use BNPL payment solutions, which allow for more flexibility in the purchase phase, or credit card payments, which could be perceived trust-worthy by customers, allow for differed payments and give the possibility to obtain a chargeback, with respect to other forms of direct payments;
- the 2022 edition of SPACE finds that credit transfers seem increasingly relevant as the amount spent grows, while the shares of cards and e-payments remain roughly constant;
- consumer preferences may vary based on the type of goods and services purchased. A national association of merchants noted BNPL solutions such as Klarna and Riverty are particularly popular in its country in the fashion industry;
- there is evidence (although not limited to online transactions) that consumers tend to use payment instruments such as credit transfers and direct debits more frequently for recurring payments. Recurring payments are defined as those made on a weekly, monthly, annual, or other regular basis, generally for high amounts. This evidence is once again supported by the 2022 edition of *SPACE*,<sup>144</sup> which shows how this type of payment appears to differ from other online transactions where card payments are generally preferred by most European consumers.
- consumer preferences may vary based on the instrument or device used for the transaction and across desktop and mobile devices. The consumer survey, as described in Figure 2.14, found evidence that consumers who prefer making their online purchases via smartphone or tablet have higher rates of digital wallet ownership or usage than those who favour laptops. While the respondents to the merchant questionnaire reported that payment methods are generally equally popular on desktop and mobile, there are some exceptions. These include Visa and Mastercard debit cards, for which 3 out of 6 merchants reported they are more used on desktop; Apple Pay, which was reported to be more popular on mobile devices

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<sup>142</sup> The use of mobile payment applications in the offline payment environment can have positive spillovers in the online environment, enabling the expansion of those applications in the online payment sector.

<sup>143</sup> The report is available online: [Study on digital wallet features](#).

<sup>144</sup> In particular, the study finds that direct debit is reported as the most used payment method for rent or mortgage, loans, taxes and public charges and for telephone, utility and internet bills while credit transfer seems to be the most popular option for subscriptions and insurance expenses.

by 2 out of 4 respondents.<sup>145</sup> In these cases the merchants provided no indication on the extent of such differences in popularity.<sup>146</sup> A merchant active in the air transport sector also reported accepting Google Pay and Apple Pay only on its app and not on its website.<sup>147</sup>

The interviews with associations of merchants suggest that merchants' acceptance is likely to reflect – *inter alia* – consumers' preferences. During the interviews conducted with two associations of merchants, it emerged that the factors which most influence merchants in the choice of a specific payment method are consumer preferences and reach of the payment methods – which are closely interrelated – followed by the cost of the payment method. Similarly, an association representing fintech and third party providers reported that merchants base their choice of which payment methods to offer on their check-out page on three criteria in the following order: reach, conversion (i.e. how many of the consumers that start the checkout journey are then effectively paying and finalizing the purchase), and only lastly, the cost of the payment method.

A national association of merchants noted that merchants usually tailor payment options to their target consumers based on their expected preferences, gathered through market research. According to the association, merchants indeed tend to accept payment methods that allow them to maximise reach among consumers.<sup>148</sup>

While consumers' preferences play a crucial role for determining merchants' acceptance of payment method, they are not the sole drivers. Merchants' costs also may affect merchants' demand for payment methods, and consumers inertia may leave room for merchants steering the choice of consumers.<sup>149</sup>

### **3.2.1.2. Merchants' costs**

The costs of the payment method were discussed as another important driver of merchants' choices. A European association of merchants noted the cost of payment methods can contribute to explaining the rise in acceptance of more innovative and cost-efficient payment methods, such as account-to-account payments and instant payments, which might be domestic but less costly than traditional methods.

Merchants' costs are not only driven by the level of fees, but also the risks merchants will have to bear. For instance, according to an association interviewed by the Project Team, IDEAL charges a flat fee on transactions paid by the acquiring bank and its remuneration

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<sup>145</sup> Two respondents also indicated that Amazon Pay and Google Pay are more used on mobile devices, but they were the only respondents that provided an indication for these payment methods.

<sup>146</sup> Merchants were asked to reply to the following question: "*Please indicate whether each payment option below is more popular on desktop, mobile or both*" for each of the payment methods they accept.

<sup>147</sup> Despite the project team's follow-up with additional requests for clarification, it remains unclear whether this is driven by merchant's preferences or by mandatory requirements from Apple and Google for their mobile operating systems.

<sup>148</sup> This seems to be in line with the Commission's approach in recent merger cases in the online payment market. In a merger case decision of 2022 concerning the merger between the mobile wallet providers Vipps and MobilePay (Case M. 10935), the Commission notes that "*merchants aim at offering a range of payment methods to avoid customers dropping out of the shopping process before payment*". Case M.10935 - DNB / DANSKE BANK / SB1 / EIKA / BALDER / VIPPS / MOBILEPAY. European Commission. 21/10/2022, §94.

<sup>149</sup> The discussions with industry associations during scoping interviews revealed that merchants could be required or incentivized to offer specific payment methods by national regulations. For example, the legislation could mandate merchants to offer some form of deferred payments at the check-out page, contributing to the rise of BNPL solutions.

is independent from the actual execution of the payment. While this may imply lower fees per transactions, merchants face higher fraud risks. Payment methods business models, other than the mere level of fees, might also be relevant when assessing overall costs for merchants. Similarly, merchants may prioritize security, over other dimensions, when determining the payment methods to be accepted for certain sector of economic activity (e.g. gaming and gambling sector). For instance, an association of PSPs pointed out that in the gaming and gambling sector, merchants tend to accept cards with ICS brands.

Merchant's costs could also be the result of contractual arrangements with payment methods providers requiring preferential treatment for their payment methods. Merchants can indeed receive economic benefits from displaying more prominently a payment method. Merchants could also decide to favour a payment method, regardless of any arrangements with the providers, by displaying it more favourably if it is more economically advantageous than others. The stakeholder consultation gave some evidence about this behaviour. In fact, 7<sup>150</sup> merchants reported adopting display practices either by choice or due to contractual agreements.<sup>151</sup>

However, merchants must ensure that customers do not abandon the checkout process, and consumer inertia may limit their ability to influence consumers' choices, as it will be discussed below.

ECommerce EU commented costs are often not decisive and consumer preferences and reachability are most likely the most significant factors. As a demonstration, the association mentioned the increasing adoption by merchants of BNPL solutions, even though they are among the most expensive payment methods for merchants.

However, the findings of the questionnaire for online merchants confirmed that high customer usage and costs are both key drivers for accepting a payment method, with 15 out of 16 merchants citing usage among the top-3 factors, and 13 out of 16 merchants also selecting fees and charges.<sup>152</sup>

All in all, merchants will have to strike a balance between consumers preferences and costs. Their ability to steer consumers towards the solutions that are the most convenient for them also depends on the different effects arising from consumer inertia.

### **3.2.1.3. The role of consumer inertia**

The behavioural experiment conducted by the Project Team (chapter 2) suggests that merchants could potentially leverage display practice to steer consumer choices toward specific payment method.

Display practices are likely to be more effective when they decrease the convenience of consumers to select their preferred payment method – the show-more display practice appears to have a higher effect than upstreaming and defaulting on the likelihood of consumers switching from their preferred method.<sup>153</sup> The effectiveness of practice,

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<sup>150</sup> We excluded from this count the display practices adopted based on the customer's most recent choices.

<sup>151</sup> Of these, five reported using them solely by choice, while two anonymous respondents stated that they had specific contractual agreements.

<sup>152</sup> More precisely, respondents were asked "What are the top-3 factors that influenced the choice of payment options that you decided to offer?", but they were not given the possibility to rank the indicated options by their importance.

<sup>153</sup> It is important to underline that due to experiment design the results of the show-more display practice is not immediately comparable with upstreaming and defaulting. However, results suggest a higher effectiveness.

however, is highly context and individual dependent. The experiment shows display practices are more effective on individuals purchasing on e-commerce platforms they are familiar with and on more trivial purchases point.

In the behavioural experiment, the payment method promoted by the display practices are owned – although not preferred – by consumers. The design of the experiment included two separate tasks: the first task revealed the underlying preferred payment method of the respondent, and when exposed to a display practice in the second task, the experiment would assess whether this practice can influence the selection of payment method away from the preferred method. Indeed, in the absence of a display practice in the first, individuals' preferred payment method<sup>154</sup> is revealed. The effectiveness of a display practice was then measured as whether it can induce a change from the preferred payment method from one task to another. The payment method promoted in task 2 was among the methods owned by the consumers.<sup>155</sup>

The experiment results show that merchants could potentially leverage display practices to influence the selection of payment method away from the preferred method. However, they can do so effectively only when they suggest a payment method that consumers already possess. In fact, the display practices may not be effective when the consumers must sign up for a new payment method.<sup>156</sup>

The survey reveals indeed that 74% of respondents stated that if an online store did not offer the option to check out using a payment method they already possessed, they would prefer to restart the purchasing process on another website rather than register for a new payment method (see Figure 2.61).

The relevance of consumers inertia in online payments was also confirmed during scoping interviews by some of the associations interviewed by the Project Team: an association of merchants reported consumer inertia plays a relevant role in determining the success of certain payment methods over time and that it is very difficult to change consumers' habits, especially for certain segments of the population (e.g. older users); an association of PSPs identified consumer inertia as one of the biggest barriers to enter in a new market.

Evidence on multihoming—the extent to which consumers own *and* use multiple payment methods for online transactions—offers further insights into consumer behaviour.

The consumer survey conducted by Verian (see section 2.3.1.2) suggests that in all but two (Spain and Italy) of the 14 selected countries, consumers own on average more than 2.5 payment methods per person. Moreover, in 10 out of 14 countries, consumers own on average more than 3 payment methods each. However, only 46%<sup>157</sup> of respondents reported frequently using more than one payment method when shopping online. In particular, the survey highlighted (see Figure 2.32) that relying on a single payment

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<sup>154</sup> It is crucial to note that in task 1 the order of display of payment method options was randomised between each respondent. This allows the research to set-aside any potential ordering effects.

<sup>155</sup> Unlike the other display practices, in the Show More practice up to three payment methods owned but not selected by the respondent could be promoted (see section 2.2.5).

<sup>156</sup> The experiment data also suggest that the number of payment methods owned by an individual and how frequently they are used also had a significant impact on their likelihood of switching payment option. Generally, having a larger portfolio of payment methods used frequently was found to increase the likelihood of switching. Those that only use a single method frequently had a 40% to 50% lower predicted likelihood of switching.

<sup>157</sup> Please note this percentage is based on survey respondents and it is not representative of the attitudes of the European consumers as it is not weighted by the size of the countries in terms of population.

method for most online transactions is especially common in countries like France and Hungary, where less than 40% of respondents—specifically, 29% in France and 38% in Hungary—frequently use more than one payment method.

Limiting the analysis to those who shop online regularly<sup>158</sup>, more than 39% of European consumers who have more than one payment method choose to use primarily one for most of their purchases. This number is particularly high in France (49%), the Netherlands (46%) and Austria (46%).

Additionally, more than 60%<sup>159</sup> of those who frequently use multiple payment methods online actually use only two. In fact, "multi-switchers"—those who frequently use three or more different payment methods—make up more than 20% of survey respondents in only three countries: Sweden and Portugal (25%) and Poland (31%). Since the survey also revealed that multi-switchers tend to be younger than the rest of the population, it will be particularly interesting to monitor whether this consumer segment will become more prevalent in the future.

Finally, 91% of respondents stated that they have preferred payment methods and always choose one of them, while only 3% disagreed with this statement.

The report by Verian for the ECB<sup>160</sup> affirmed that some consumers fear that using multiple payment methods could make it easier to lose control over certain expenses.

The report *Payment behaviour in Germany in 2023*<sup>161</sup> by the Bundesbank suggests that German consumers own multiple payment methods in the online and offline environment: 97% of them own a debit card and 52% own a credit card; 33% of the respondents have also reported they own multiple debit cards and 12% reported they own multiple credit cards.

In addition, 33% of respondents who reported owning a credit card and 24% of respondents who reported owning a debit card have uploaded their cards to a mobile app.

In comparison with the consumer survey—which considers frequent use of the payment method as evidence of multi-homing—this report relies solely on the mere possession of suggesting that multi-homing is slightly more widespread (even within payment methods); however, this evidence is not limited to the online environment and is based only in Germany.

While there is some evidence of multihoming among consumers in the online payment sector, this phenomenon appears to be limited, as most consumers frequently use at most two different payment methods for their online purchases, regardless of the websites they visit or the products they buy. This, combined with consumers' reluctance to sign up for new payment methods, necessitates careful evaluation by merchants, who must ensure they minimize drop-off rates at checkout while also controlling costs. Merchants may tend to accept multiple payment methods, to cater for different consumer preferences.

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<sup>158</sup> Non-frequent online buyers make up only 7% of the sample.

<sup>159</sup> See 157.157157157

<sup>160</sup> The report is available here: [Study on digital wallet features](#).

<sup>161</sup> The "Payment behaviour in Germany" study series provides a comprehensive picture of the use of cash and cashless means of payment at the physical point of sale, in online retail and between individuals.

The respondents to the questionnaire, for instance, indicated they offer multiple payment methods, with an average of 7.94 different options to pay.<sup>162</sup>

### **3.2.2. Constraints to the ability to offer payment methods**

As discussed, payment platforms are two-sided markets, and their demand is represented by two different groups of economic agents: consumers and merchants. The supply side of the market is represented by the operators active in the payment sector, which serve as intermediaries between the consumers and the merchants and provide any infrastructure, technology or service that facilitate the transfer of digital funds.

The evidence on the main factors influencing supply-side substitutability has been investigated by the Project Team through the analysis of the responses provided by participants in the card scheme questionnaire, the providers of payment applications questionnaire, as well as based on interviews.

First, the responses to the questionnaire, although the sample was limited, have highlighted that, according to most operators, providers offering different payment methods or relying on different payment services could still exert a competitive pressure on each other.

This is suggested both by the responses provided by card schemes and by the responses provided by payment applications. Two ICS, in their written contributions to the study, both emphasized how the competitive landscape is constantly changing and shifting. As a result, a competitor can offer both competing and complementary services and the two ICS face competition from local and regional networks as alternative payment providers or payment processors, affirming that these different and broad competitive landscapes across EEA makes it difficult to define a fixed list of competitors.

Differently, domestic card schemes have identified all Mastercard and Visa as the closest competitors. Additionally, two of them have indicated Paypal as their third closest competitor.

Providers of payment applications generally perceive ICS as close competitors. In fact, three of them put them as closest competitors while others two selected them in the top five.

Digital wallets have also been considered close competitors by many providers of payment applications. For example, one of the respondents who provides account-to-account services identified Apple Pay as their main competitor, while another local account-to-account operator pointed to the entire category of Big Tech wallets as primary competitors. Additionally, Apple Pay was ranked among the top five competitors by four other providers. Lastly Paypal was considered the main competitor by one provider and among the five closest by other three. Interesting a PISP perceives Swish, iDEAL and Apple Pay as main competitors.

Despite the above, there also exist some evidence suggesting there might be some frictions when shifting supply from one payment method to another.

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<sup>162</sup> The payment methods listed by the questionnaire were the following: Visa credit cards; Mastercard credit cards; JCB credit cards; domestic credit cards; Visa debit cards; Mastercard debit cards; JCB debit cards; domestic debit cards; Paypal; Amazon Pay; Apple Pay; Google Pay; Samsung Pay; account-to-account; cash on delivery; buy-now-pay-later; 3PS Amex Diners.

Local players may face some barriers expanding cross-border. The ability to provide international transaction may attract merchants, as it increases reachability which is one of key driver of their choice of acceptance. Through questionnaires and direct interviews, the Project Team gathered more information by domestic payment application providers and domestic card schemes about the main obstacles that limit their expansion into other countries.<sup>163</sup>

The most common difficulties by domestic payment applications providers seem to be related to developing an adequate network of banks or PSPs supporting the service in other Member States, developing an adequate acceptance network among merchants, and promoting the brand among consumers. Another aspect highlighted by more than one provider is the technical difficulty behind developing an interoperable cross-border infrastructure.

One of the domestic card schemes that participated in the consultation highlighted that IT difficulties related to developing a cross-border infrastructure represent a barrier to expansion. The domestic provider also mentioned regulatory barriers, and the lack of interoperability between systems.

Consumer habits, and consequently merchants' acceptance may also represent a barrier to substitutability. Two domestic card schemes contributing to the consultation identified the development of merchant acceptance as one of the major challenges. Another domestic scheme that was interviewed by the Project Team emphasized how the development of an acceptance network also requires a substantial financial effort in exchange for uncertain returns. As it will be further explored in section 3.3.3, in many European countries, some emerging payment methods—such as PIS, BNPL operators, and PISPs—still hold relatively small shares of online transactions. This raises doubts about their current ability to challenge widely used and accepted payment methods, such as cards or digital wallets.

The findings collected through the stakeholder consultation suggest that there may be limits to the ability of providers of payment applications to expand their offer by integrating different payment services.

As discussed in Annex G, the questionnaire for payment providers asked payment application providers to specify the services on which their applications are based. They were also asked whether they plan to expand their offerings by integrating additional payment services, and if not, to explain the reasons behind their decision (e.g., low margins from integration, lack of competitive pressure, technical challenges, or agreements with other market participants that prevent such actions).

The results indicate that most providers (58%) do not plan to expand their payment service offerings in the foreseeable future. Two of them indicated that the main reasons for this decision appear to be related to technical hurdles. On the other hand, one respondent, which currently operates as a fully A2A payment application, reported that it is planning to introduce the option to pay by card.

Although some operators have made investments in different payment services in recent years — such as Visa and Mastercard, which individually acquired Tink and a stake in Blik, respectively, and jointly developed Click to Pay, seen as a potential alternative to major digital wallets — overall it appears likely that providers of payment methods may not be

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<sup>163</sup> In the next chapters, some attempts by account-to-account payment solutions to overcome national limitations will be discussed. In particular, the initiatives led by EPI and EuroPA will be described.

able to fast switch to alternative payment services, also since this decision would entail building the necessary commercial relationships.

Notwithstanding the above, payment methods relying on the same payment services are not necessarily equivalent to one another. Compared to international card schemes, domestic card schemes face challenges as (i) becoming operational online and (ii) ensuring operability via digital wallet.

During the interview, a domestic scheme explained that its main challenge in the online world arise from the fact that the PAN and CSV of co-badged cards, which are reported on the card and held by consumers, correspond to the international card scheme. For years, this was an insurmountable barrier to expanding its online operations. However, in recent years, technological developments have allowed some domestic schemes (e.g., MB Scheme, Bancomat and Dankort) to develop alternative solutions – mainly based on account to account services – to ensure their online operability.<sup>164</sup> The domestic scheme also specified that, for a card to be usable on wallets like Apple Pay and Google Pay, specific investments are required from both the scheme and the issuer. These investments are scheme-specific for issuing banks. As a result, banks often prefer to avoid duplicating investments, and the adopted standard typically reflects that of the most widely used scheme (i.e. the international scheme).

Finally, the assessment of the supply substitutability in the online payment sector, is further intricated by the vertical relationships across players: e.g. ICS are a relevant input for digital wallets, and both perceive the other as a close competitor.

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<sup>164</sup> In particular, the applications Bancomat Pay, Dankort app and MB Way.

### 3.3. The recent evolution of the online payment sector

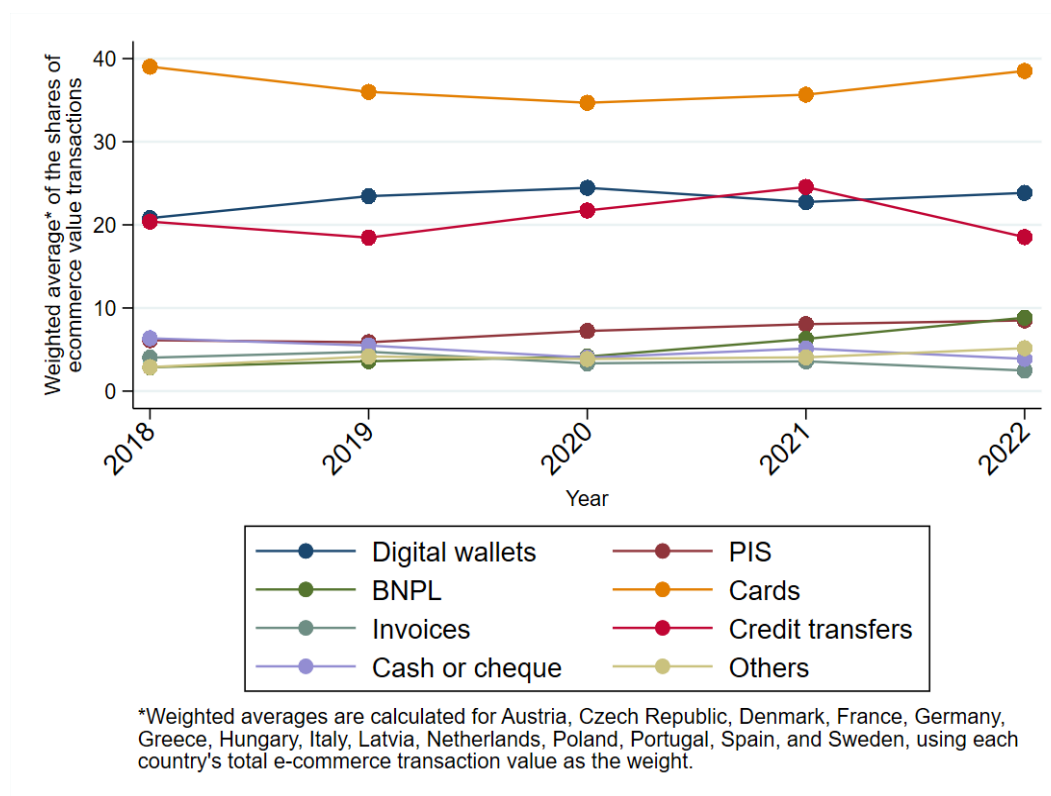
#### Key take-aways

- Card based payment methods are widely used across the EEA and, despite the recent market developments, they maintain a strong market position in many of the selected countries. While data does not allow to disentangle the role of ICS and domestic schemes, the qualitative evidence available suggests this is likely to be driven by ICS, as domestic schemes face several challenges being operational online, or more generally being available in digital wallets. Chapter 4 investigates further the reasons why cards, and ICS in particular, have been able to maintain a prominent position in online payments;
- Digital wallets are becoming more and more important (and this may further reinforce also the relevance of cards, and more specifically, ICS). This growth has been driven by the increasing relevance of digital wallets offered by Big Tech companies (Apple Pay, Google Pay, Amazon Pay). Although Paypal has been widely used in the EEA for a long time, data suggests that its usage is declining relatively to other digital wallets, at least in certain countries. Chapter 4 also investigates whether certain practices deployed by Big Techs that leverage their proprietary platforms may have helped to promote their own online payment services;
- The role of PIS and BNPL solutions is increasing. Domestic PIS are the most popular payment method in Poland and Netherlands. However, no operator has yet emerged as being relevant at a European level. From this perspective, it will be interesting in the coming years to see what effects will arise from the initiatives led by EPI and EuroPA. Despite the entry into force of PSD2, PISP such as Trustly and Sofort have struggled to emerge at a European level, remaining currently relegated to a marginal role in the e-commerce sector. Finally, BNPL operators have strengthened their share of online transactions, especially in the Nordic countries and Germany, but remain marginal in some countries such as Greece, Portugal, and the Czech Republic;
- There is a relative heterogeneity of national online payment markets as evidenced by the varying penetration of payment methods and the presence of several domestic players across EEA countries. It is interesting to note that these differences between the various EEA countries do not appear to have particularly decreased from 2018 to 2022.

As discussed, consumers have a wide variety of payment methods at their disposal to pay for their online purchases, some are more traditional (e.g. cards, credit transfers) others have entered the online payment sector over the last decade. This section provides an overview of the intensity of competition in the selected countries, based on the evolution of the share of online transactions of the main providers of online payments in last five years. Data will shed light on the dynamics of entry and exit and will help examine barriers providers are facing to expand in the online payment sector. Quantitative data are corroborated with the qualitative insights gathered during the stakeholder consultation and the findings of the consumer survey.

Figure 3.1 below provides the evolution of several online payment methods in the selected countries in Europe in the period 2018-2022.<sup>165</sup> The figure below aims at assessing the distribution of e-commerce transaction across online payment methods over time, without prejudging market definitions.

**Figure 3.1: Evolution of online payment methods in Europe (shares do not include wallets transactions backed by cards in Cards category)<sup>166</sup>**



Source: Based on Capgemini data

<sup>165</sup> Please note that the present graph is based on the countries covered by the Report. In particular, the graph is based on the data on the payment methods' value of e-commerce transactions in the following countries: Austria, Czech Republic, Denmark, France, Germany, Greece, Hungary, Italy, Latvia, Netherlands, Poland, Portugal, Poland, Spain and Sweden.

<sup>166</sup> Since some payment methods are inputs to others, there may be instances of double counting, and it is not always possible to completely disentangle one method from another. Where feasible, card transactions are reported separately from wallet transactions; however, minimal double counting could still occur in certain countries.

From the graph, several trends can be observed at the EU level:

- cards,<sup>167</sup> digital wallets<sup>168</sup> and credit transfers<sup>169</sup> are overall the most widely used payment methods in the countries analysed based on e-commerce transaction values;
- card payments are relatively constant in terms of shares as the most popular payment method in Europe;
- digital wallets overcame credit transfers as the second payment method by usage in the selected countries;
- new payment methods, such as PIS<sup>170</sup> and BNPL operators<sup>171</sup> appear to be increasingly used in the countries analysed;
- cash on delivery is becoming less and less popular.

The remainder of this section discusses these trends in detail, considering country specificities. In particular, section 3.3.1 discusses the role of payment cards in the market for online payments, while sections 3.3.2 and 3.3.3 discuss the role of relatively new players in the market, and in particular the increasing role of digital wallets and the emergence of innovative payment methods, such as PIS and BNPL.

### 3.3.1. The role of payment cards

Card payments are widely used across the EEA. Table 1.6 in section 1.2 provides the shares of various categories of payment methods used in online e-commerce transactions in 2022 across different European countries. In particular, the table provides the share of each payment method in the overall value of e-commerce transactions in each country. Card payments are the most popular payment method in Europe.

Credit card payments seem to be slightly more popular in online environment than debit cards) except for only three countries (Hungary, Poland and Portugal).

Also, the evidence from consumer survey shows cards are an extremely popular payment method. In fact, 64% of respondents had declared to have and have used a credit or a debit card to make an online purchase and cards seem to be used more frequently by their owners compared to Paypal (Table 2.7). In fact, more than 30% of respondents said they use card payments almost always, while only 15% reported doing the same for Paypal and

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<sup>167</sup> The category includes online payments made directly using credit cards, debit cards, and prepaid cards. Card-based transactions implemented using a digital wallet are not included in this category.

<sup>168</sup> In the Digital Wallet category, all the payments executed using a digital wallet are included. In particular, the following operators are included: Apple Pay, Google Pay, MasterPass, Samsung Pay, BBVA Wallet, Giropay, MobilePay, Meta Pay, Click to Pay, Paypal, Amazon Pay, Visa Checkout, Caixa Wallet, e-Postepay.

<sup>169</sup> Credit Transfers category includes both (S)CT(-Inst) and SDD.

<sup>170</sup> The PIS category includes the following operators: iDEAL, Bizum, Swish, Trustly, Sofort, Nexi Pay, Blik, Mybank, BANCOMAT Pay, ePrzelewy, Dankort app.

<sup>171</sup> The category BNPL Operators does not include invoice payments that are grouped in the Pay by Invoice category of Table 1.6. It includes the following operators: Klarna, Riverty, previously AfterPay, and Scalapay. Although Klarna has different functions, they cannot be separated and for that reason its operations are fully categorized under BNPL.

among those who generally use only one payment method for their purchases, 40.8% rely almost exclusively on cards while only 17.5% use exclusively Paypal<sup>172</sup>.

Consumer preferences appear to be in line with the views of market participants. An association of PSPs observed that card payments are considered a must-have by merchants in most European countries.

The cards must-have status was also confirmed by the stakeholder consultation. Data collected through the merchant questionnaire shows that a significant majority of merchants consider offering Visa (87.5%) and Mastercard (81.25%) credit cards on their websites as essential. Similarly, for debit cards, 62.5% of respondents consider Visa and Mastercard options a must-have, while only 56.25% consider domestic debit card options essential. In contrast, only 6.25% of merchants regard JCB credit cards as essential, and just 18.75% consider 3PS cards (such as Amex and Diners) as a necessity.

The drivers behind the success of card payments, and in particular Visa and Mastercard, appear certainly to be related to consumer demand, in line with the considerations of section 3.2.1

One of the association of merchants contacted by the Project Team explained that consumer inertia plays a relevant role in determining the success of certain payment methods over time and that it is very difficult to change consumers' habits, especially for certain segments of the population, such as the relatively older age group. Another factor which, paired with consumer inertia, may contribute to explaining the popularity of cards for online payments is the spill-over effect from the POS market. Card payments have been available for POS payments in the EEA since the 1960's (see section 1.3.4); as people got accustomed to use them for POS payments, it was easier for card schemes than for other operators which do not rely on cards to also penetrate the online payments markets as consumers increasingly relied on e-commerce.

Moreover, certain security standards, such as tokenization, could help make consumers perceive card payments as a secure and trust-worthy payment method, and this may be another reason why they are preferred to other methods. The views of industry participants gathered during the scoping interviews suggest such conclusion.

As mentioned in section 3.2.1, a national association of merchants explained that credit card payments tend to be more frequently used with respect to other payment methods in specific sectors, such as the travel industry, where generally the value of payments is higher, and this is mainly because such payment method is considered more secure and trust-worthy by consumers than other payment methods.<sup>173</sup>

A national banking association reported security is one of the main advantages of card payments compared to account-to-account payments. For example, the bank can offer the customer a dispute management service that it cannot provide with account-to-account services. This more thorough service, in case of issues with card payments, is directly linked to the support that banks receive from networks when problems arise. In their opinion, these factors also influence the acceptance of the payment system by merchants, who are much better protected in case of disputes due to fraud attempts.

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<sup>172</sup> Please note these percentages are based on survey respondents and are not representative of the attitudes of the European consumers as they are not weighted by the size of the countries in terms of population.

<sup>173</sup> Please note that this is not the only possible explanation as credit cards, for example give consumers the possibility to make a deferred payment or the right to chargeback.

However, the consumer survey conducted by Verian does not seem to support this major safety perception among consumers. In fact, in terms of protecting against financial loss, the consumers perception of cards security is comparable<sup>174</sup> to those of other payment methods.<sup>175</sup>

While the success of cards is consistent with the drivers of competition in online payments, certain market conducts implemented by card schemes and/or other market players that are involved in card-based transactions (i.e. banks and wallets) may contribute to strengthening their position, as will be discussed in section 4.1.

The idea that other operators involved in card-based transactions could promote the use of cards over alternative payment methods has also been suggested by some associations. For example, an association of merchants noted that banks have an interest in favouring cards as these payment methods – other than being largely accepted by merchants – are the most remunerative for them.

However, it is important to note that some European banks are sponsoring projects aimed at creating internationally active account-to-account payment systems within the European Union through participation in initiatives such as the one led by EPI (Wero) or EuroPA.

With technological progress allowing the emergence of innovative payment methods, consumer demand and retailers offering have been evolving and gradually shifting towards more convenient (mobile wallets, PIS solutions) and flexible (BNPL) payment methods.

As discussed in section 1.3, the introduction of smartphones in 2007, of new technologies such as NFC, and mobile P2P transfers contributed to the rise of such methods. Moreover, the push towards contactless payments and online payments, accelerated by the Covid-19 pandemic, has significantly boosted the use of alternative payment methods in the EU, such as some PIS (e.g. Blik, Swish, iDEAL) and digital wallets. The fact that using some of these payment methods in POS transactions was more streamlined (as well as more hygienic during Covid-19) compared to traditional payment methods such as non-contactless cards or cash has certainly had an impact on the adoption of these tools among consumers and on merchants' acceptance, which in turn could be leading to a growth in their relevance in online transactions.

In Figure 3.2, it is shown the evolution of the share of card payments (credit, debit and prepaid) over the total e-commerce transactions values in selected EEA countries.

The figure reveals different trends across the EEA. Countries such as Spain, Greece, and Portugal have seen an increase in card payments overall e-commerce value transactions shares relative to other methods in recent years, while the opposite trend is observed in countries like France, Italy and Sweden. However, fluctuations in the e-commerce value transactions for cards over the last 5 years have generally not exceeded 10%.

The figure also unveils the extreme popularity of cards especially in countries as Greece, France, and Spain. In fact, these countries are characterized by the extreme relevance of card payments, which account for 58.99%, 51.13%, and 54.36% of the total value of online transactions, respectively in 2022. In contrast, in countries such as Germany, Poland, Hungary, and the Netherlands, card transactions have a lower shares of e-

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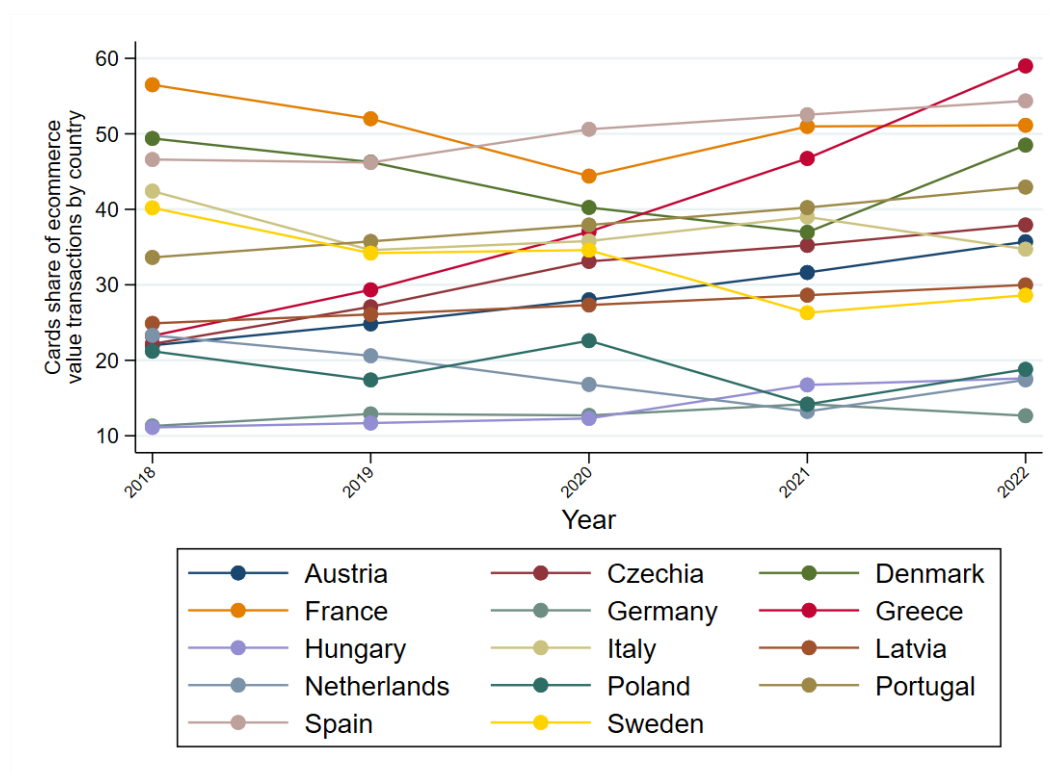
<sup>174</sup> For example, slightly higher than Google Pay but slightly lower than Apple Pay or Bank Transfers.

<sup>175</sup> However, it is important to note that since cards are used more than wallets and have been widespread among consumers for many years, many more people may have encountered issues with cards compared to more recent payment methods like Google Pay or Apple Pay.

commerce value of transactions. Caution is however required when making such assessment, as card transactions figures do not include those made via digital wallets.

The consumer survey also suggest that card usage is more widespread in Greece and Spain, where 81% and 79% of respondents, respectively, stated that they own and have used a credit or debit card online, compared to all other selected countries. Meanwhile, France, recorded a very high percentage of respondents—more than 37%—who rely almost exclusively on cards, either by choice or because they do not own any other alternatives.

**Figure 3.2: Evolution of the share of card payments (credit, debit and prepaid) over total e-commerce value of transactions in selected EEA countries (shares do not include wallets transactions backed by cards in Cards category) <sup>176</sup>**



Source: Project Team based on Capgemini data

Although at first glance, the steady trend in the graph may suggest that card payment methods are engaged in fierce competition to maintain their prominent position in the current e-commerce payment sector of the EEA, it should be noted that some of the emerging methods, such as some of the most widely used digital wallets, rely on payment cards as payment services, and therefore their transactions contribute to the card schemes' business volumes.

<sup>176</sup> Since some payment methods are inputs to others, there may be instances of double counting, and it is not always possible to completely disentangle one method from another. Where feasible, card transactions are reported separately from wallet transactions; however, minimal double counting could still occur in certain countries.

Capgemini estimation suggests that, on average, 27.6% of ICS credit cards transactions are processed through digital wallets (see section 1.5).<sup>177</sup>

### 3.3.2. The increasing role of digital wallets

As shown in Figure 3.1 above, digital wallets are now the second most popular method in the countries analysed.

The development of payment tokenisation (discussed in section 1.3.5 and Box 3.1) may have also contributed to the rise of digital wallets, increasing their convenience and security.

Table 1.6 in chapter 1 shows that, at the end of 2022 in six of the selected countries, pass-through digital wallets were the most used type of digital wallet, while in the other eight cases, the most used type was staged digital wallets.

With regards to pass-through digital wallets, the highest shares of online value transactions attributable to these types of wallets is observed in Denmark (23.24%), due to the popularity of the domestic player MobilePay (14.22%), Czech Republic (14.47%) and Hungary (10.64%), while the lowest shares are observed in Austria (1.61%), France (4.43%) and Poland (5.09%).

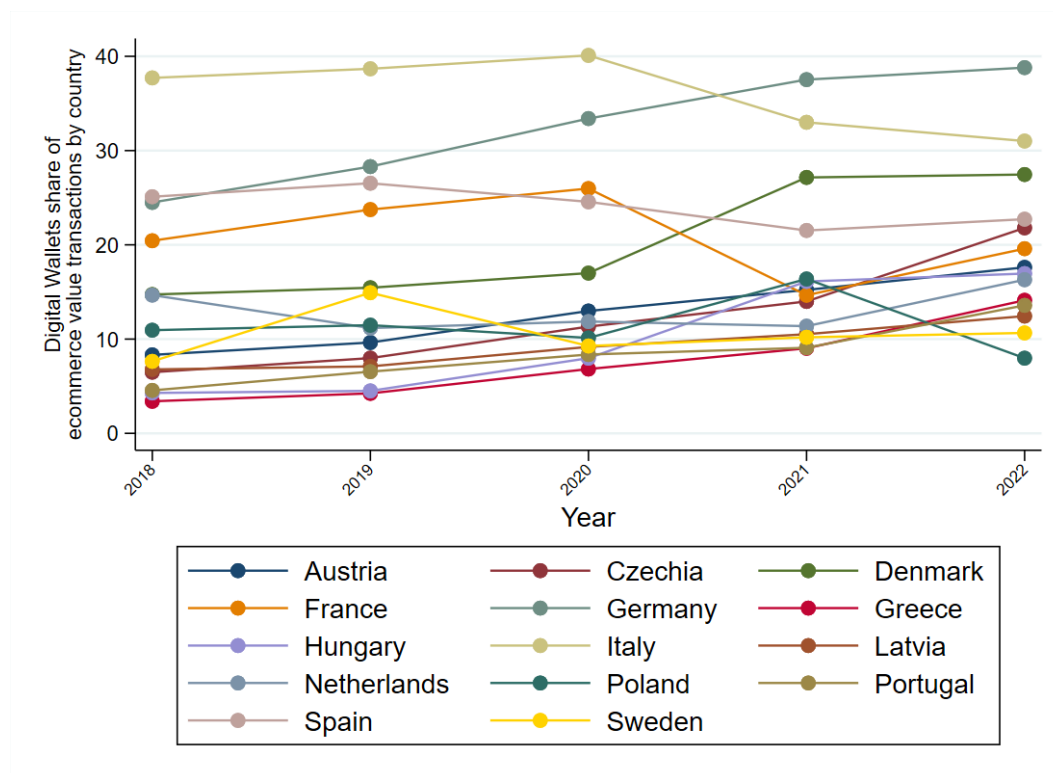
Instead, staged digital wallets, which include Amazon Pay and Paypal, appear to be used widely in countries as Germany (30.00%), Italy (25.50%), and Spain (17.45%) while being less common in Sweden (2.86%) and Poland (2.89%).

Figure 3.3 below, representing the evolution of digital wallets over the period 2018-2022: Germany (38.80%), Italy (31.01%) and Denmark (27.46%) are the countries where digital wallets represent the highest share of overall transactions in 2022. In Poland and Sweden digital wallets are less popular, representing 7.98% and 10.66% of the overall value of e-commerce transactions in 2022, well below the average observed among the countries analysed.

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<sup>177</sup> Information on the share of wallets' transactions through cards is not available. In addition, there might be some limited double counting between digital wallet transactions and card transactions in Figure 3.1. These limitations impede to compute the overall share of e-commerce transactions backed by cards.

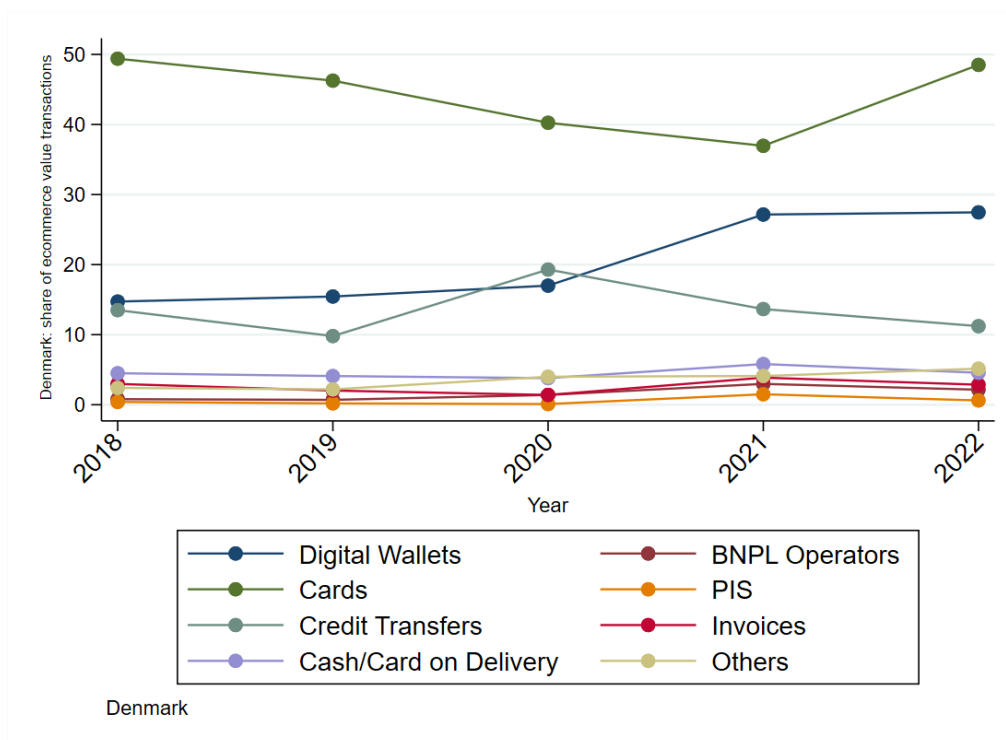
**Figure 3.3: Evolution of the share of digital wallets over total e-commerce value of transactions in selected EEA countries**



Source: Based on Capgemini data

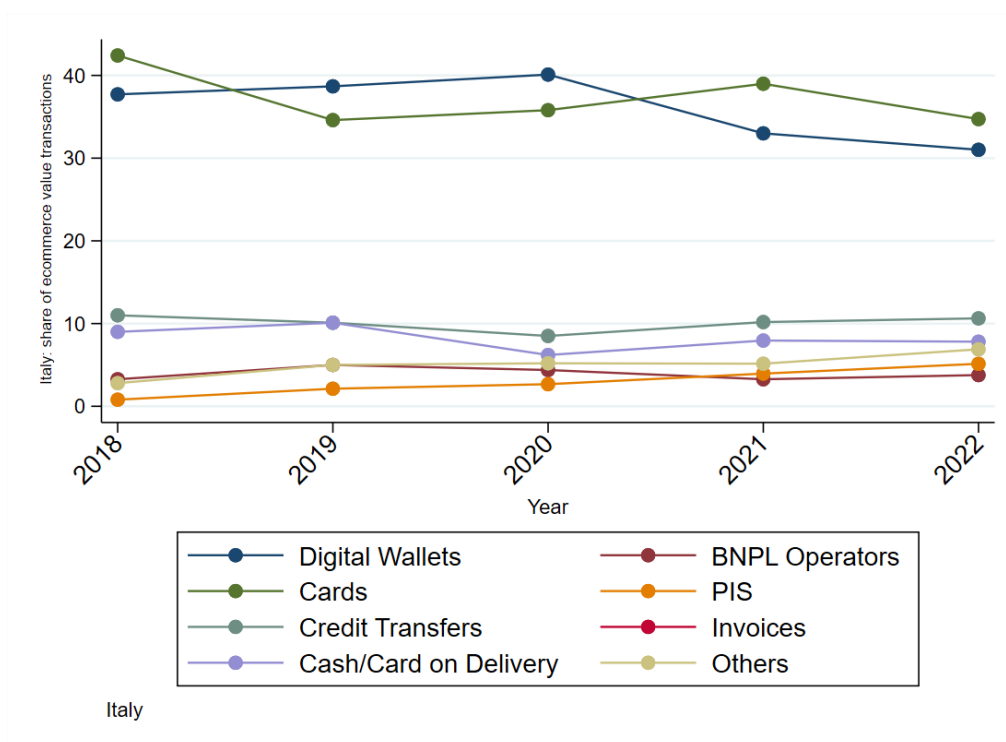
Although Figure 3.1 shows a slight increase at the European level between 2018 and 2022, rising from 20.81% in 2018 to 23.85% in 2022, Figure 3.3 reveals that this growth was not equally distributed across countries. On one hand, countries like Germany and Denmark (Figure 3.4) experienced significant growth in the share of digital wallets in total e-commerce transaction value, increasing by 58.37% and 86.44%, respectively, in relative terms. On the other hand, countries such as Italy (Figure 3.5), Spain, Poland, and France (Figure 3.6) saw a decline in the share of digital wallets from 2018 to 2022.

**Figure 3.4: Evolution of payment methods in Denmark**

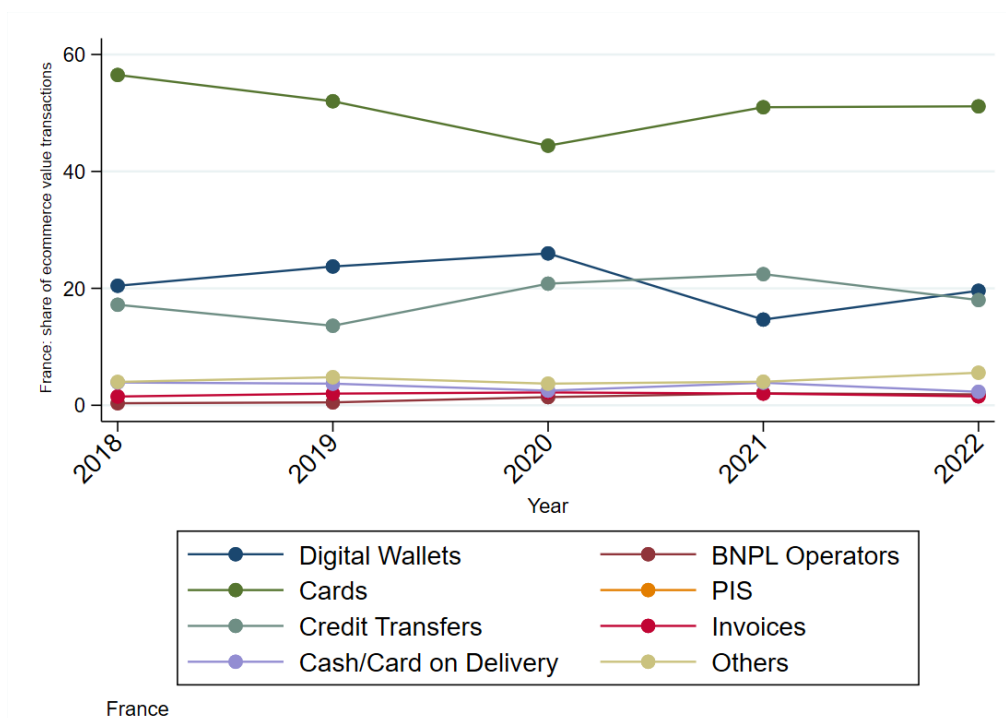


Source: Based on Capgemini data

**Figure 3.5: Evolution of payment methods in Italy**



Source: Based on Capgemini data

**Figure 3.6 : Evolution of payment methods in France**

Source: Based on Capgemini data

As discussed in greater detail in section 4.3, although the online payments sector is experiencing significant growth, the digital wallets of Big Tech companies, particularly Apple Pay and Google Pay, are growing at a rate higher than the industry average, thereby strengthening their market position. Meanwhile, Paypal's growth rate has declined over the years, although, as highlighted also by the consumer survey, it remains a highly popular payment method in most of the countries analysed. Confirming this trend, it is important to note that in the cases of Italy, Spain, Poland, and France, Paypal's share of the total e-commerce transaction value has declined by 8.39%, 6.13%, 5.21%, and 2.91%, respectively, only partially offset by the growth of other digital wallets, which, when already active, started from significantly lower levels of popularity.

However, as shown in Table 4.1, Paypal remains the most prominent digital wallet for online payments in all the selected countries except for three. Among these, Apple Pay is the most popular digital wallet in Sweden and Poland, while in Denmark, the local solution MobilePay prevails.

The consumers survey confirmed that Paypal is the most widely used digital wallet, as 65% of respondents stated that they own it and have used it for online purchases, while Apple Pay and Google Pay lag significantly behind, with percentages of 13% and 19%, respectively. However, Apple Pay appears to be used more frequently by its owners, as

61% of them report using it at least frequently, whereas this percentage drops to 48% for Google Pay while only 47% of Paypal<sup>178</sup> owners use it frequently.

In terms of overall adoption, the consumer survey confirmed that Paypal is more widespread in Germany, Italy, Spain, and Austria, where 88%, 77%, 77%, and 72% of respondents, respectively, reported owning and have used Paypal for digital payments. Meanwhile, Apple Pay is more popular in countries such as Sweden (28%) and Denmark (24%), while Google Pay sees higher adoption in the Czech Republic (39%).

Interestingly, Apple Pay appears to be less frequently used by its owners in Sweden compared to the average in the other countries, with only 18% stating that they use Apple Pay almost always. In contrast, it is used very frequently by Czech users, with as many as 41% of Apple Pay owners reporting that they use it almost always.

A large diffusion of Paypal emerged also during scoping interviews with industry associations: for example, an association of PSPs observed that Paypal holds a significant role in Germany, despite being particularly expensive for merchants. As it will be greatly discussed in section 4.4, its must have status, consumer inertia, perception of security has ensured its relevance until recently.

Historical data suggests that the growth rates of Big Tech Wallets in recent years have been significantly higher than those of Paypal. Among these, Apple Pay, in particular, has quickly gained popularity in the online payments sector. The PSP association identified as main drivers for their growth the consumer demand driven by the greater convenience offered by these operators, thanks to, for example, very user-friendly interfaces, notably for Apple Pay (see also section 4.3). Another interviewed association representing a broad range of business models covered by PSD2 argued that the primary goal of Big Tech companies is to enhance user experience and attract users to their main business activities (i.e. their platforms), rather than payments themselves.

The factors contributing to the rise of digital wallets provided by Big Techs, the differences among individual wallets and the potential drivers of differences in their success are further investigated in section 4.3.

### 3.3.3. Other emerging payment methods

Another recent development in the market is represented by the emergence and increasing role of innovative payment methods, such as PIS and BNPL. As shown in Figure 3.1, the share of e-commerce transactions represented by PIS operators in the countries analysed increases by 2.38% in absolute terms and 38.88% in relative terms in the period between 2018-2022.

With regards to PIS operators such as iDEAL, Swish or Blik, a European association of merchants explained that such methods were originally used by customers for P2P transactions and are now being increasingly adopted by merchants in physical and online stores, also considering their lower cost for merchants than more traditional payment methods. According to the association, it is easier for a merchant to promote a new payment methods in physical store (e.g. by the means of a QR code) than it is in online stores, where merchants have fewer effective means to encourage consumers to use their

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<sup>178</sup> These percentages are based on respondents of consumer survey. They should not be considered representative of the general spread of payment methods, as they are not weighted by the population of the countries.

preferred option.<sup>179</sup> The association explained that current legislation prohibits surcharges by merchants on the regulated payment methods that are explicitly mentioned in Article 62 of PSD2 and it is therefore complex for merchants to use price signals to steer consumers towards cheaper options.

Moreover, the association noted that many of the most common PIS in the EEA have a domestic dimension, underlying the popularity of the following domestic operators in their respective countries: Swish in Sweden, Payconiq in Belgium, iDEAL in the Netherlands, Blik and e-Przelewy in Poland and Bizum in Spain.

To overcome their domestic dimension, several initiatives were launched in the recent past. European Payments Initiative (EPI) is an initiative backed by 16 European banks and financial service operators to progressively build Wero. EPI will begin its operations in 5 European countries (Belgium, France, Germany, Netherlands and Luxembourg) initially supporting person-to-person transactions followed by online and mobile shopping and then point of sale payments. EPI acquired Payconiq and iDEAL in October 2023 and launched its service (Wero) in France, Germany and Belgium in 2024 initially only supporting person-to-person transactions. It is currently expected that the service will also be launched in the Netherlands and Luxembourg in the coming months. The launch of WERO has already led to the discontinuation of some payment methods such as Giropay in Germany, and it is anticipated that Payconiq and iDEAL will also be gradually replaced by Wero once the new features are integrated.

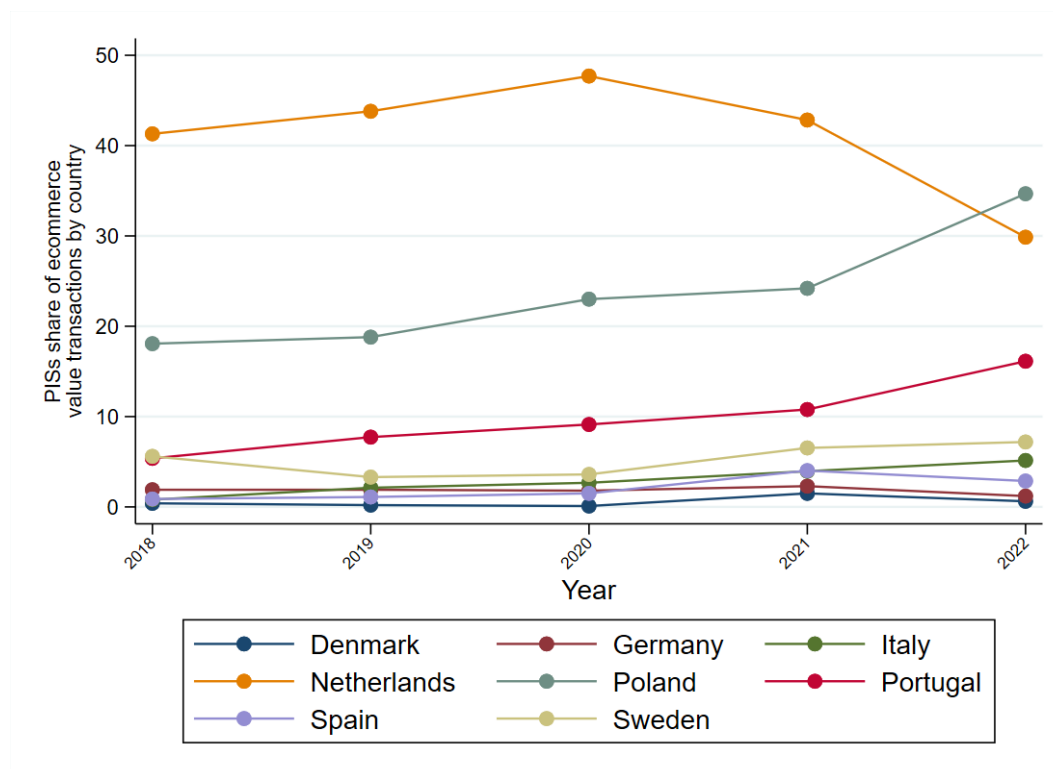
Another initiative that is worth mentioning is the European Payment Alliance (EuroPA), a partnership aimed at achieving interoperability between Bizum, MB SIBS, and Bancomat. This project will soon provide users of each payment application with the ability to send instant transfers to their personal counterparts in other countries. According to the information collected by the Project Team through the stakeholder consultation, the initiative is expected to expand into the e-commerce sector in the coming years, although the detailed application plans are yet to be defined.

The potential impact of EPI and the EuroPA Project on the competitive dynamics of the online payment sector in the EEA will be further discussed in section 4.2.

Figure 3.7 below shows the evolution of the shares of e-commerce transactions represented by PIS operators in the countries analysed. The figure underscores the prevalence of PIS operators in the Netherlands and Poland.

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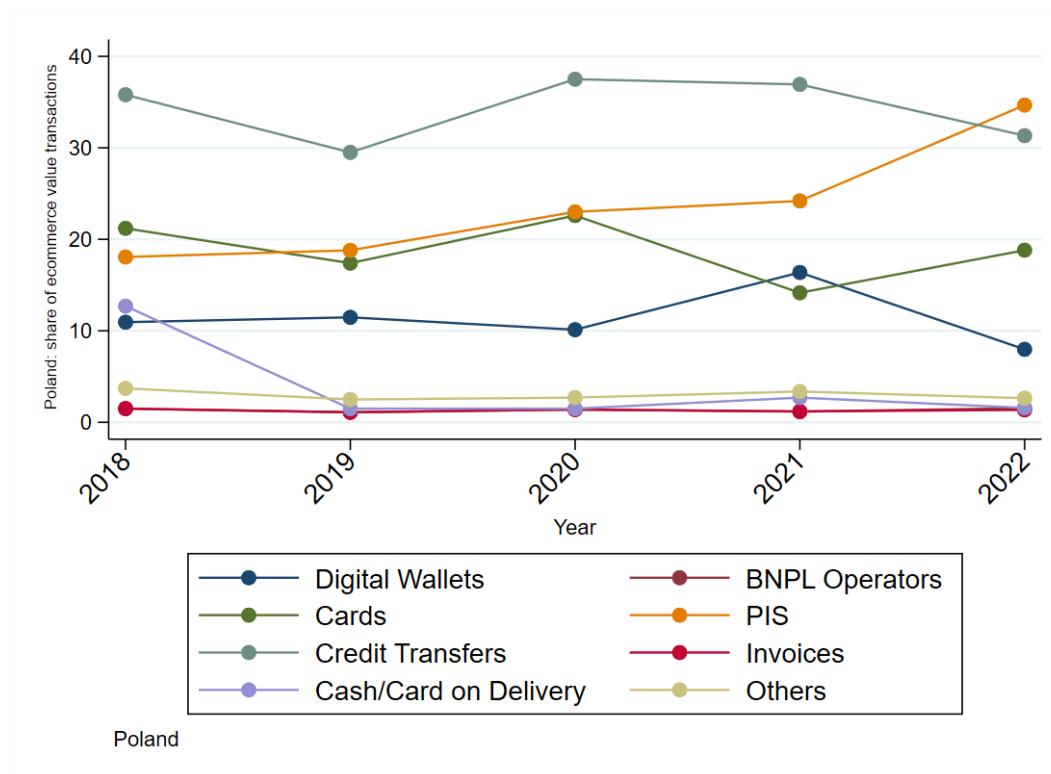
<sup>179</sup> However, some respondents reported to incentivise some cheaper payment options online in the merchant questionnaire.

**Figure 3.7: Evolution of the share of PIS over total e-commerce value of transactions in selected EEA countries**

Source: Based on Capgemini data

In these countries, the share of PIS operators is well above the weighted average observed in the countries analysed in 2022 (8.27%), being respectively 41.10% in the Netherlands and 23.75% in Poland on average in the period 2018-2022. This is due to the prevalence of very popular domestic operators in such countries. In fact, in Poland Blik and e-Przelewy<sup>180</sup> represent together 34.67% of the value of e-commerce transactions in 2022, with Blik representing the second most popular payment method in the country with a share over the overall value of e-commerce transactions of 29.07% in 2022.

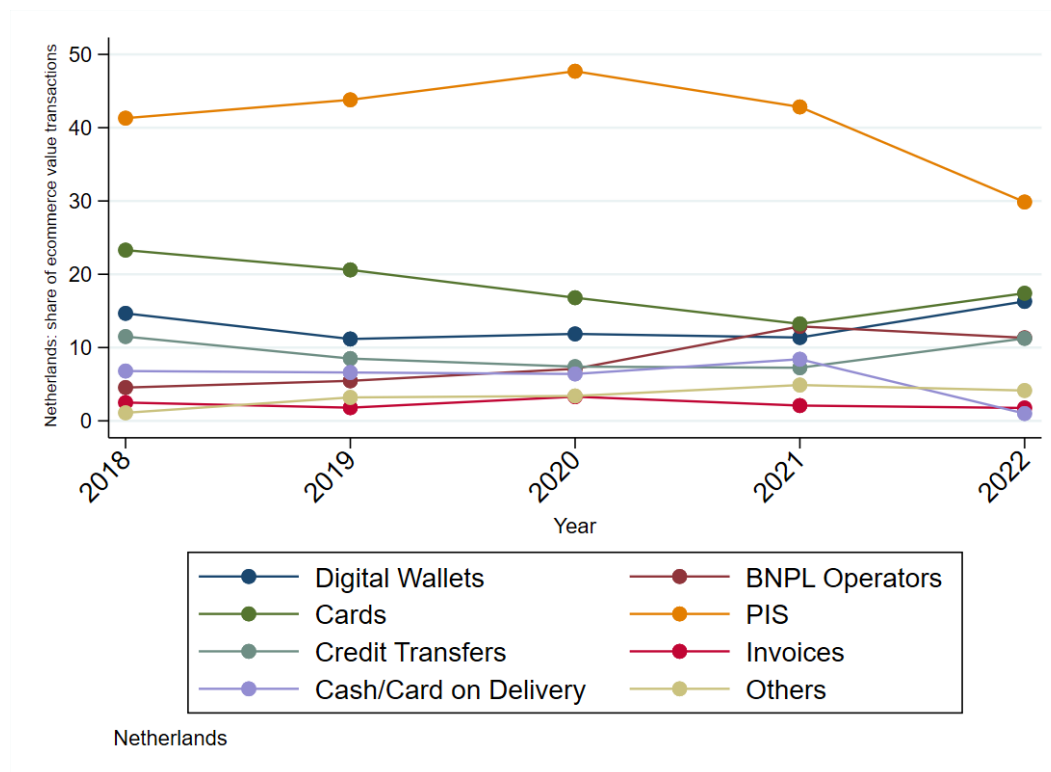
<sup>180</sup> Note that e-Przelewy integrate also cards, however since data does not give the possibility to differentiate its whole volume was allocated to pis only. However general considerations remain valid.

**Figure 3.8: Evolution of online payment methods in Poland**

Source: Based on Capgemini data

Similarly, the PIS operator iDEAL is the most widely used payment method in the Netherlands as suggested by industry associations interviewed by the Project Team and the available data. By looking at Figure 3.9, the category of PIS operators in The Netherlands, which only includes iDEAL in our data, represents on average 41.1% of the overall value of online transactions in the country in the period 2018-2022.

The extreme popularity of iDEAL in the Netherlands and Blik and e-Przelewy in Poland was also confirmed by the consumer survey. In fact, 97% of Dutch respondents have reported to have and have used iDEAL to make online purchases while Blik and e-Przelewy was owned respectively by 70% and 60% of Polish respondents. In addition, these applications, particularly Blik and iDEAL, seem to be widely used by their owners. For both, 83% of users reported using them at least frequently, and over 40% almost always. These percentages drop to 54% and 9%, respectively, for e-Przelewy.

**Figure 3.9: Evolution of online payment methods in the Netherlands**

Source: Based on Capgemini data

One association of merchants explained that one of the reasons behind iDEAL's popularity among merchants is its cost-effectiveness pricing solution: iDEAL adopts a very low flat-rate per transaction. This statement was confirmed also by the association representing fintech and third-party providers in Europe who noted that iDEAL charges very low prices in the Netherlands, with some studies showing that the banks owning the payment provider are in fact making negative margins.<sup>181</sup>

On the reasons behind the fact that these types of payment applications are mostly domestic, the industry associations interviewed have provided some tentative explanations. According to the association of merchants mentioned in the previous paragraph, this could depend on the fact that banks from different countries must cooperate to ensure that these solutions are accepted and supported cross-border, and on the fact that expansion should require a very strong brand knowledge by the consumers.<sup>182</sup>

The PSP association interviewed by the Project Team also noted that technical reasons could explain the difficulty to expand for such operators. In the case of iDEAL for example, the service was developed as a domestic solution for several large Dutch banks, and this is reflected in the technical setup of the application. It would therefore be very expensive,

<sup>181</sup>For reference see "Study into the costs and revenues of payment services for financial institutions 2021" available online at the following link: <https://www.betalvereniging.nl/wp-content/uploads/Final-report-study-costs-and-revenues-of-payment-services-2021.pdf>.

<sup>182</sup> According to the national association of e-merchants interviewed by the Project Team, however, agreements between banks should not represent a big obstacle to expand cross-border for these types of operators.

according to the association opinion, to change the infrastructure of the application to be used by non-Dutch banks.

Probably, this factor could have also pushed the Dutch banks to join the project led by EPI to develop a cross-border payment solution rather than trying to expand iDEAL abroad.

When asked to identify the main obstacles they face, or anticipate facing, in making their services available in other countries, four domestic providers of A2A payment applications highlighted the challenge of developing a network of banks or PSPs (Payment Service Providers) in other Member States to support their services.

Additionally, all emphasized that building brand recognition among consumers would pose a significant hurdle. One of them further noted that gaining acceptance from merchants in other Member States would also be a key difficulty.

Finally, another provider of payment applications identified several other challenges, including divergences in supervisory practices across different Member States, restrictions on the use of passporting to provide services in certain countries (citing the absence of universal passporting for payment systems and payment schemes across all EU countries), and the technical complexities involved in creating an interoperable cross-border infrastructure, attributing the latter issue to differing access conditions to RTGS (Real-Time Gross Settlement) payment systems across EU countries.

Lastly, it must be noted that the PIS category analysed in this report includes also operators such as Trustly and Sofort, which are considered under PSD2 as independent third-party providers.

The penetration of these operators in online payments market appears to be quite low in all the countries analysed. The share of such payment providers is always below 2.5% in all the country analysed in the period 2018-2022.

The diffusion of these types of operators across Europe, and the development of open banking more generally, has been one of the objectives of the "Payment services (PSD2) - Directive (EU) 2015/2366" adopted by the European Parliament and European Council and applied by Member States since 2018. PSD2 has, in fact, laid the groundwork for the emergence of the so-called open banking space. Among other prescriptions, PSD2 required banks and other financial institutions to allow access to their customers' financial data, limited for the purpose of providing the service, to other banks and other authorised institutions, e.g. independent third-party providers, such as Payment Initiation Service Providers (PISP) and Account Information Service Providers (AISP), provided that the customer has given consent. This is *inter alia* technically achieved using APIs.

### **Box 3.2: A description of PSD2**

The revised Payment Services Directive (PSD2), adopted on 12 January 2016 and to be transposed by EU Member States by 13 January 2018<sup>183</sup>, marked a significant evolution in the European online payments landscape. Its primary objectives included fostering a more integrated and efficient payments market, levelling the playing field

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<sup>183</sup> Certain security measures, notably those concerning SCA under Articles 65, 66, 67, and 97 of PSD2, were subject to a delayed implementation. As per Article 115(4), these measures became applicable 18 months after the entry into force of the Regulatory Technical Standards (RTS) outlined in Article 98. See: [https://ec.europa.eu/commission/presscorner/detail/pl/memo\\_17\\_4961](https://ec.europa.eu/commission/presscorner/detail/pl/memo_17_4961).

for PSPs, and enhancing the security and protection of European consumers. PSD2 introduced a regulatory framework designed to accommodate new players, stimulate innovation, and ensure robust consumer safeguards, thereby supporting the development of a dynamic and competitive payments ecosystem<sup>184</sup>.

A key innovation under PSD2 was the introduction of rules for third-party providers (TPPs), including Account Information Service Providers (AISPs) and Payment Initiation Service Providers (PISPs). These provisions allowed non-bank entities to access payment account information (with user consent) and initiate transactions directly including through APIs provided by banks.

Furthermore, PSD2 mandates Strong Customer Authentication (SCA) to enhance security and minimize fraud risks while introducing consumer protections such as liability caps and mandatory refund rights for unauthorized transactions. SCA mandates the use of at least two of three authentication factors to validate the identity of the payment service user. This framework was designed to address growing concerns over fraud and cybersecurity risks in digital payments, particularly as the volume of online transactions continues to rise in Europe and around the world.

The introduction of SCA transformed the payments ecosystem in several ways. First, it enhances consumer confidence by reducing instances of unauthorized transactions, thus fostering trust in digital payments. Second, it incentivizes PSPs to invest in advanced authentication technologies, such as biometrics and tokenization, to comply with the regulatory requirements. This not only strengthens the security of payment systems but also stimulates technological innovation among both traditional financial institutions and fintech companies. However, the implementation of SCA also posed challenges, particularly in achieving a seamless user experience. To address these concerns, regulators introduced exemptions for low-risk transactions, recurring payments, and low-value purchases, striking a balance between security and convenience.

PSD2 lowered barriers to entry for non-bank payment service providers, creating opportunities for fintech companies and other innovators.

Through its emphasis on open banking, PSD2 required traditional banks to provide regulated TPPs with access to customer account data including via APIs. This shift enabled a wide range of new entrants, including fintech firms and technology-driven innovators, to introduce novel payment solutions and financial services.

Non-bank providers leveraged PSD2's framework to challenge traditional payment markets and offer tailored services that directly addressed consumer needs. For example, account aggregation services enabled consumers to view financial data from multiple accounts in one place, while payment initiation services facilitated seamless and secure transactions without relying on traditional card networks.

In addition to fostering new entrants, PSD2 reshaped the structure of payment value chains. The directive's mandate for standardized APIs facilitated the integration of e-wallets and alternative payment methods, including real-time bank transfers and e-money solutions, which gained popularity as consumers look for faster and more flexible payment options. However, the competitive landscape also witnessed market consolidation, as smaller providers struggled to adapt to PSD2's technical and

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<sup>184</sup> The revised Payment Services Directive (PSD2) and the transition to stronger payments security. (March 2018). [https://www.ecb.europa.eu/press/intro/mip-online/2018/html/1803\\_revisedpsd.en.html](https://www.ecb.europa.eu/press/intro/mip-online/2018/html/1803_revisedpsd.en.html).

compliance requirements, leading to acquisitions or exits. While PSD2 changed the dynamics of the European payments market, it also revealed several challenges that necessitate further regulatory evolution. For instance, the fragmented implementation of PSD2 across Member States has hindered full harmonization, creating inefficiencies for cross-border service providers. Additionally, the regulatory framework has struggled to keep pace with technological advancements.

As the payments landscape continues to evolve, the European Commission has initiated discussions on PSD3 and PSR to build on the foundation established by PSD2. PSD3/PSR aims to address emerging challenges in the digital payments ecosystem, such as ensuring the resilience of payment systems against cyber threats, enhancing interoperability among payment solutions, and refining the regulatory framework for open banking. By addressing these issues, PSD3/PSR seeks to further consolidate the gains achieved under PSD2 while adapting to the technological and market developments shaping the future of payments. Additionally, PSD3/PSR is expected to place increased emphasis on consumer data protection, particularly in the context of growing concerns over data privacy and the rise of new data-driven business models.

*Source: Project Team*

The PSP association observed that the Directive has had limited impact on the e-commerce market. Similar evidence was gathered during the interview conducted with the national banking association, which has highlighted three key reasons for the slow adoption of alternative payments in its country: consumers prefer well-known brands and fear data security risks, even with authorized providers; PSD2 led banks to prioritize legislative compliance over usability of the new infrastructures required by the directive leading to complaints from TPPs regarding inefficient interfaces; banks receive no remuneration for maintaining the required infrastructure, making PISP transactions a cost burden and reducing incentive to innovation. Finally, the association representing fintech and third-party providers expressed concerns that the limited impact of PSD2 can be attributed to its implementation by banks. Specifically in its opinion, banks have offered PISPs poor-quality APIs which negatively affect user experience, as will be discussed in section 4.2.

The association also explained that some of its members have been operating in the online payment market for over 20 years, prior to the implementation of PSD2. Nevertheless, it noted that the penetration of these players across the EU countries was, and still is, very heterogeneous. This is mainly due to historical factors.

The association explained that some countries like Germany, Austria and the Nordics already had established open banking players prior to PSD2 implementation, like Sofort in Germany (which was launched in 2005 and is now owned by Klarna) and Austria, Tink (introduced in 2012 and owned by Visa since 2022) and Trustly (introduced in 2008) in Sweden.

In contrast, the open banking adoption has remained limited in other European countries. The association specifically noted that TPPs have consistently struggled to gain traction in the Netherlands, due to the market position of iDEAL.

According to the association, banks could have strong incentives to hinder the entrance of PISPs in the online payments market, as open banking could potentially challenge the market position of certain players that offer banks a higher remuneration as well as the bank own position.

Another recent legislative measure by the EU that could have a significant impact on the world of digital payments is the Instant Payment Regulation (IPR), adopted by the European Parliament and the European Council in March 2024. Regarding the IPR, an association of merchants stated that this new regulation could provide an additional boost to instant payment and account-to-account solutions, while another association

interviewed by the Project Team explained that the regulation entails the provision of access to the interbank payment system. According to the latter association, in the account-based universe, there are fewer players precisely because access to the bank clearance system was required. However, with instant payments, this barrier could be gradually overcome.

### **Box 3.3: A description of IPR**

The Instant Payments Regulation (IPR), adopted by the European Parliament and the Council on 13 March 2024, marks a pivotal step in the evolution of the European payments landscape.

The adoption of the IPR has redefined the competitive dynamics of the European online payment sector by lowering barriers to entry and creating opportunities for non-traditional PSPs to compete. By mandating the availability of instant payment services and expanding access to payment infrastructure, the IPR has introduced new incentives for innovation and reduced reliance on legacy payment systems.

Its primary objective is to accelerate the widespread adoption of instant payments within the European Union. To achieve this, the IPR mandates the provision of instant payment services by all PSPs offering traditional credit transfers, ensuring payments are processed within ten seconds and available continuously. This requirement represents a significant shift toward real-time financial systems, ensuring that instant payments become a standard service rather than an optional feature.

Another essential element of the regulation is the principle of cost equality between instant and regular credit transfers. PSPs are required to charge the same fees for instant transfers as they do for standard credit transfers of comparable type, thereby removing cost as a barrier to adoption. This measure fosters price transparency and encourages both consumers and businesses to embrace instant payments without incurring additional financial burdens.

To address fraud risks, the IPR mandates that PSPs provide a free Verification of Payee (VoP) service, which ensures that the name of the intended recipient matches the account identifier (IBAN) provided by the payer. By introducing this layer of protection, the regulation not only minimizes errors and potential fraud but also enhances trust in digital payment systems. Furthermore, PSPs are required to perform daily sanctions screenings to ensure compliance with EU financial regulations. This provision guarantees that instant payments are executed swiftly without compromising the robustness of regulatory checks, reinforcing confidence in the system's integrity. The regulation also expands market access for non-bank PSPs, such as electronic money institutions (EMIs) and payment institutions (PIs). Previously, these entities were often excluded from direct participation in key infrastructures such as TARGET Instant Payment Settlement (TIPS), a market infrastructure service launched by the Eurosystem in November 2018 which enables payment service providers to offer fund transfers to their customers in real time and around the clock, every day of the year. With the IPR, these entities are now allowed direct participation in TIPS system, a key infrastructure to transfer funds within seconds of the transaction, previously accessible only to traditional banks. By granting this access, the IPR fosters competition, enabling fintechs and other non-bank players to innovate and compete on equal footing with established institutions.

The impact of this reform can be observed in the expansion of existing players that specialize in instant payment solutions. For example, companies such as Revolut and Wise, have leveraged the regulation to expand their offerings into euro-denominated instant payments. These firms now participate directly in central bank-operated payment systems, bypassing traditional banks and reducing the settlement time and

cost for their customers. In sum, the implications of the IPR for emerging payment methods are profound. Merchants, for example, no longer need to rely on payment guarantees, as they can see payments being executed and settled in real-time within their accounts. This shift reduces dependency on intermediaries and simplifies cash flow management. Additionally, by opening access to central bank-operated systems, the regulation lowers structural barriers, enabling a wider array of payment providers to enter the market and drive innovation. Enhanced consumer protection mechanisms, such as the VoP service, further boost customer trust, creating a favorable environment for new and alternative payment solutions.

Source: Project Team

Regarding BNPL operators (Klarna, Riverty, formerly AfterPay, and to a lesser extent Scalapay), Figure 3.10 illustrates the growing popularity of these payment solutions in certain countries among the selected ones. Specifically, in Germany, the share of e-commerce transaction value increased from 2.3% in 2018 to 18% in 2022. In Austria, it rose from 4.89% to 7.58%, and in the Netherlands, it surged from 4.55% to 11.33%. Meanwhile, in Sweden (see Figure 3.11), it grew from 11.64% to 19.25%, driven largely by the success of the national operator, Klarna. Nonetheless, the popularity of these solutions seems to be lower in other countries as in Czech Republic (0.5%) and Portugal (0.16%).

With regards to the Netherlands, an association of merchants underlined the increasing popularity of BNPL operators in the country, referring to Klarna and Afterpay/Riverty. As previously noted, the association explained that the increasing popularity of such payment solutions is partly due to factors connected to the consumer demand, since they provide a flexible payment solution which is appealing to consumers and partly by regulation referring to the introduction of a national law which prohibited merchants from requiring consumers to pay more than 50% of the price of the goods offered on the site upfront.<sup>185</sup>

The consumer survey confirmed that Klarna appears to enjoy greater popularity in Sweden, where 65% of respondents reported owning and have used it for online payments. It also maintains a good level of popularity in Austria (49%), Germany (44%), and the Netherlands (34%).

In contrast, Afterpay seems to be less commonly used, as it only reaches 20% of usage in the Netherlands.<sup>186</sup> However, this could be linked to the rebranding that took place in October 2022, when the company changed its name to Riverty since the Riverty brand was not included among those submitted to consumers in the consumer survey.<sup>187</sup>

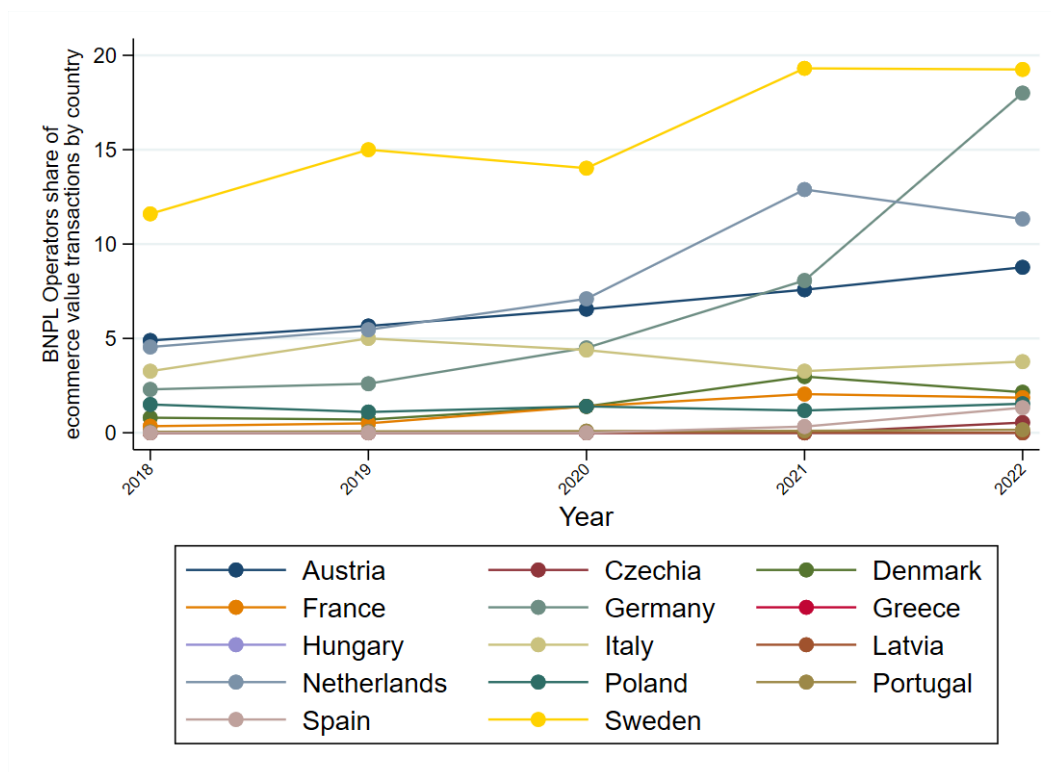
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<sup>185</sup> See [Dutch Civil Law](#) Article 7:26 Payment of purchase price p.2 “The payment of the purchase price has to be made at the moment and at the place of the supply of the sold object. In the event of a consumer sale agreement the buyer may only be obliged to pay half of the purchase price in advance.”.

<sup>186</sup> Percentages below 5% were also recorded in Germany and Denmark.

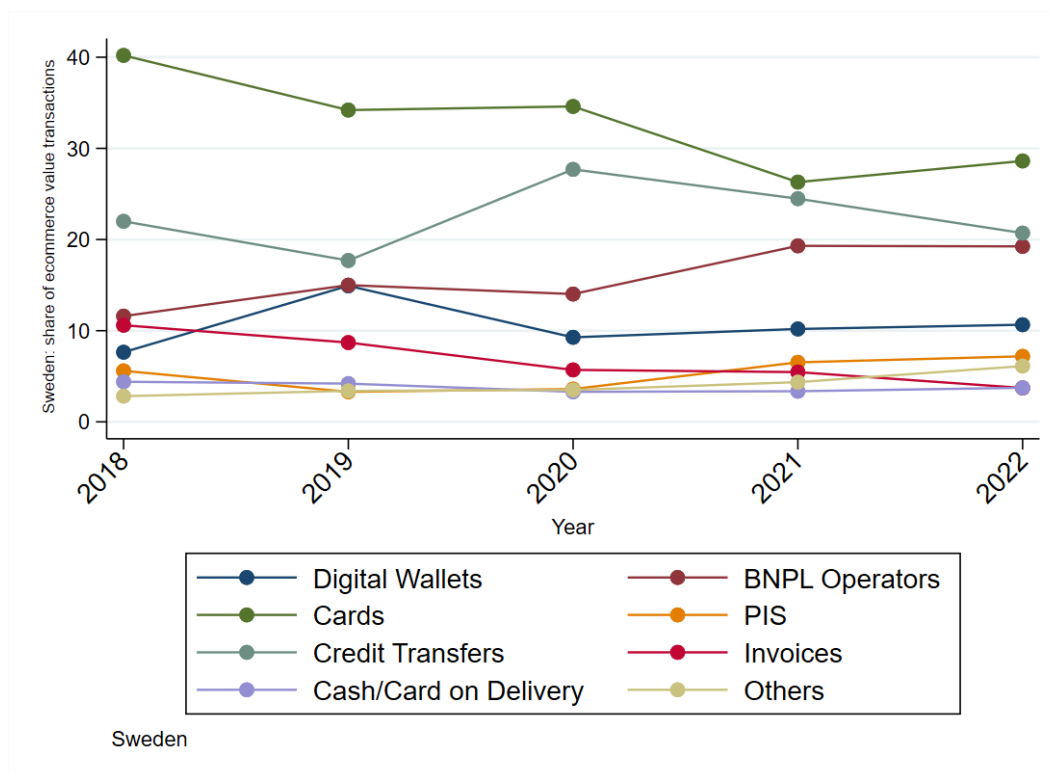
<sup>187</sup> In fact, the Afterpay brand was used.

**Figure 3.10: Evolution of the share of BNPL operators over total e-commerce value of transactions in selected EEA countries**



Source: Based on Capgemini data

**Figure 3.11: Evolution of online payment methods in Sweden**



Source: Based on Capgemini data

## 4. Chapter IV: The potential sources of competitive concerns in the online payment sector

The online payment sector is inherently characterized by certain structural features that contribute to raising barriers to entry and/or expansion for market players.

First, payment platforms are two-sided platforms characterized by strong network effects. Network effects can be:

- direct: the more consumers use the service, the more valuable it is for other consumers. This effect may be particularly relevant for those digital wallets offering peer-to-peer functionalities;<sup>188</sup>
- indirect: the larger the user base, the more merchants will be willing to accept a certain payment method on their platform; as mentioned in section 3.2.1, nearly all the merchants responding to our questionnaire indicated that usage by consumers is indeed one of the most relevant drivers behind their choice to accept certain payment methods. On the other hand, the more merchants accept a payment method, the more attractive and valuable it becomes to consumers. These effects are a fundamental driver of competitive outcomes in the online payment sector, and in the payment industry more broadly;

These effects create a positive feedback loop that reinforces the position of large players.

Visa itself allegedly acknowledged the significant role of network effects in the online payment sector, as revealed by a complaint against Visa filed by the Department of Justice (DOJ) in September 2024,<sup>189</sup> which will be further discussed in the next section. In particular, Visa allegedly considered that *"build[ing] scale on both sides...with consumers/payers and with merchants/payees"* is *"a herculean task"* and that these effects create *"an enormous moat"* around its business (DOJ complaint, paragraph 5).

Second, psychological factors affecting consumer choice may also contribute to shaping competition in the online payment sector. Brand recognition is an important driver of the success of established industry players, especially in light of the importance that consumers place on security and safety, as discussed in section 3.2.1. Consumers perceive the payment solutions associated with well-known brands such as ICS and Paypal as reliable and trustworthy; a new entrant may need some time to reach a similar reputation. Combined with consumers' tendency to be inert, this can further contribute to raising barriers to entry and/or expansion for newcomers in the online payment sector (see discussion in section 3.2.1).

Third, the provision of online payment services typically relies on IT infrastructures and technical standards characterized by a high degree of technological complexity and whose development requires relevant fixed investments. Large – especially global firms – are inherently advantaged, as they have the resources needed to invest and the scale to recoup such investments. Technological complexity may represent an obstacle even for some established players in the payment industry, such as card schemes. The functionalities of some domestic schemes (e.g. Bancomat, Girocard) for online payments are indeed limited

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<sup>188</sup> This is at least the case for those wallets that allow peer-to-peer transfers only among users of the wallet, such as Paypal.

<sup>189</sup> <https://www.justice.gov/opa/pr/justice-department-sues-visa-monopolizing-debit-markets>.

and, in particular, their payment cards cannot be used by consumers for online transactions through their networks.<sup>190</sup>

In addition, the technical standards developed by incumbent players such as ICS will likely prevail in the industry, since the services offered by other industry players (issuers, merchants, providers of payment application) that rely on their infrastructure need to be compatible with such standards. Ensuring compatibility may entail costs for other industry players, which may find it profitable to sustain only the investments needed to make their solutions compatible with the largest infrastructure. For example, as will be further discussed below in this chapter, card issuers may prefer to invest only in the tokenization of ICS cards. As a result, new payment solutions such as digital wallets may end up contributing to strengthening the position of ICS. This may reduce the returns that domestic schemes expect from the investments needed to expand online, thereby limiting their incentives to sustain such investments.

The above forces are mutually reinforcing and contribute to creating market leaders whose position may become hard to challenge for competitors.

Larger industry players may be able to widen the gap with their rival leveraging economies of scale. For example, ICS may be able to offer better fraud prevention tools, especially when it comes to cross-border fraud, thanks to a “learning by doing” dynamics.

The market characteristics described above suggest that scale may be a crucial factor to compete effectively in the online payment sector; and that market participants that do not reach sufficient scale may be marginalized.

The market forces resulting from these structural features have led to the concentration of relevant shares of transactions in the hands of established industry players, namely ICS and Paypal, across several MS.

As discussed in section 3.3, the online payment sector has, nevertheless, witnessed the emergence of new payment methods: digital wallets (notably those offered by the Big Techs), A2A payment solutions, which are often developed or supported by banks, and BNPL solutions (e.g. Klarna). The entry of these players can be explained by the following factors:

- they offer innovative and attractive features which differentiate their offer from that of more traditional payment methods. They typically offer a more convenient user experience (e.g. allowing consumers to pay just entering their credentials or their phone number or even through biometric authentication, for mobile payments through wallets that are integrated within mobile operating systems). Some of these solutions offer consumers the possibility to pay contactless through their mobile devices at physical POS: this feature has likely boosted adoption of these services, allowing their providers to also penetrate the online sector;
- A2A payment solutions are reportedly cheaper for merchants, compared to card-based payment methods. While merchants tend to accept the payment methods with the highest reach among consumers, they may also contribute to boosting consumer demand for new payment options which are economically more advantageous. The behavioural experiment conducted by Verian suggests display practices may allow merchants to steer consumers’ choices. Survey results show, however, that

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<sup>190</sup> As will be explained in section 4.1, most of the domestic cards in the EEA are co-badged with international card schemes. This implies that consumers are able to use these cards for online payments, but the transaction will be executed through the international network.

consumers may be reluctant to sign up for a payment method anew. Nevertheless, merchants may allow cost-effective payment methods to obtain visibility among consumers, possibly reducing the hurdles related to obtaining brand recognition;

- the Big Techs could leverage their established presence in adjacent digital markets and their large user bases, which are largely the result of network effects in these markets: this factor has given the Big Techs a competitive advantage to enter the online payment sector, as will be discussed in detail in 4.3.

It should be noted that all such innovative solutions rely on the established infrastructures provided by banks and card schemes, since payments are always executed via traditional payment services: cards, credit transfer (regular or instant), direct debit and instant payments. Therefore, they are commercially and technically linked to the established players involved in the provision of such services, i.e. card schemes and banks. This fact has important implications on the competitive role of the providers of these payment applications.

While the Big Techs may be particularly well placed to overcome the “moat” that structural features described above create around incumbent players, thanks to their large user bases, most Big Techs’ wallets (i.e. Apple Pay, Google Pay, Samsung Pay) are technically linked to the ICS, as cards represent a crucial input for their functionality. Therefore, at the moment they cannot displace ICS and they actually contribute to their business volumes. The link between Big Techs’ digital wallets and the cards’ infrastructure may, however, be the result of strategic decisions: partnerships between ICS and Big Techs may help ICS defend their position in the evolving online payment market, while also favouring Big Techs in the digital wallets’ segment.<sup>191</sup>

A2A payment methods, instead, rely on alternative payment rails, as they use credit transfers (including instant payments) as payment services. As such, they may have the potential to disrupt the online payment sector and challenge the position of established players such as ICS. However, most of these solutions have remained confined to their national boundaries. Several factors contribute to this phenomenon, and they are, again, largely related to the structural features of the industry discussed above.

Developing cross-border brand recognition may be challenging: even payment solutions that are largely prominent in a given region (e.g. iDEAL in the Netherlands, Blik in Poland) are often unknown to consumers abroad; this will make developing a cross-border acceptance network hard for providers of national payment methods. The stakeholder consultation has confirmed that this factor may represent a relevant barrier to expand cross-border.<sup>192</sup> The information collected through the consultation also suggests that developing an interoperable infrastructure that can be used cross-border bears significant additional complexity and costs; and that such technological complexity may limit the

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<sup>191</sup> An analysis of partnerships between ICS and Big Techs and their potential effects on competition in the online payment sector is provided in section 4.1.2.

<sup>192</sup> In particular, according to the results of the questionnaire for providers of payment applications, developing brand recognition among users (indicated by 6 out of 13 respondents) and acceptance/take up by merchants in other Member States (indicated by 4 out of 13 respondents) are among the most important obstacles to expand cross-border.

ability of certain operators to expand cross-border.<sup>193</sup> There is also evidence that divergences in implementing regulation may contribute to fragmentation in the EEA.<sup>194</sup>

Finally, domestic payment methods are mainly A2A and need the support of a network of banks to allow accountholders to pay from their bank accounts: developing a network of banks adhering to their payment solutions in other Member States is one of the main obstacles hindering the expansion of these payment solutions, according to the stakeholders participating in the consultation and providing A2A payment applications.<sup>195</sup>

Only recently, banks across the EEA have joined forces to overcome both the technical and commercial or reputational issues that domestic players face. Banks across the EEA are indeed currently collaborating to develop two parallel initiatives, which will be further described in section 4.2: the European Payment Initiative (EPI) – aimed at developing a Pan European A2A payment solution – and the EuroPA Project – aimed at fostering interoperability among existing domestic A2A payment solutions.

One key implication of the above discussion is that the structural features of the online payment sector may be conducive to anticompetitive behaviour. In particular, they have contributed to the creation of market leaders which may have significant market power and may also have the incentive to leverage it, being protected by barriers to entry and expansion. In addition, vertical relationships between key market players provide further incentives to leverage market power and possibly foreclose rivals.

Today, ICS have a superior bargaining power towards their commercial counterparts – merchants, acquirers, issuers and providers of payment applications that rely on their input (e.g. digital wallets) which are, however, also potential competitors: this could possibly pave the way to market conducts that further reinforce their position and shield them from actual and/or potential competition. To a lesser extent, similar considerations apply to Paypal that appears to have a significant relevance in some MS and benefits from a first mover advantage in the digital wallets' segment.

The Big Techs, while relatively new players in the online payment ecosystem, are likely to have competitive advantages over their rivals, thanks to their large user bases. On the one hand, this could in principle give them the potential to become disruptors in the online payment sector; on the other hand, this makes them attractive commercial partners for established players.

Banks have a pivotal role in the online payment value chain: recent partnerships among banks can influence the competitive dynamics in the online payment sector in the future;

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<sup>193</sup> This was the view of one industry association interviewed by the Project Team. Three providers of payment applications (out of 13) responding to our questionnaire indicated that the technical complexity behind the development of an interoperable cross-border infrastructure is one of the main obstacles that prevent them from expanding cross-border. In particular, one provider noted that access conditions to real-time gross settlement (RTGS) payment systems differ across EU countries; while another noted that hurdles related to POI integration are the main infrastructural barrier. This is in line with the views of one anonymous domestic card scheme (one of the two who replied to this question).

<sup>194</sup> Six providers of payment applications indicated that divergences in implementing relevant directives or regulatory standards across Member States are among the main obstacles they would encounter to make their services available in other countries. Five of them also indicated divergences in supervision practices. One provider noted that these factors contribute to making it difficult to operate as a PISP in Spain, Poland, Czechia, France and Italy – specifying that they only have experience about these countries but the same issue may concern others.

<sup>195</sup> Eight providers of payment applications responding to our questionnaires noted that developing a network of banks or PSPs adhering to their services in other Member States is one of the main barriers to expansion.

they may also align banks' incentives and entail a risk that they may coordinate their behaviour to affect market outcomes or foreclose rivals.

With this premise in mind, this chapter aims at describing potential practices that certain market players may implement to strengthen their position in online payments, focusing on the behaviour of those market players who may be in the position to distort competition.

While the triangulation of sources that have informed this study – data, desk research, consumer survey, stakeholder consultation – does not aim at conclusively identify any anticompetitive behaviour, it plays a critical role in understanding the incentives of market players and the potential consequences of actions that leverage market power.

In particular, this assessment focuses on: international card schemes (section 4.1), banks (section 4.2), popular digital wallet providers and, in particular, the Big Techs (section 4.3) and Paypal (section 4.4). In each section, we describe the sources of competitive advantage of each market player and the potential effects on competition of each of the identified possible conducts. Where possible, we refer to publicly available evidence and information collected through the stakeholder consultation that supports these concerns.

## 4.1. The role of ICS in online payments

### Key take-aways

- ICS, and in particular Visa and Mastercard, are established players in the online payments sector. Their cards are widely used by consumers and widely accepted by merchants across the EEA.
- Consumer survey results suggest that consumers across the EEA have a strong preference for ICS. The stakeholder consultation and publicly available evidence suggest that the acceptance rate of ICS by merchants across the EEA is close to 100%;
- Their success is consistent with the structural features of the sector: network effects, the role played by brand recognition and inertia in shaping consumer preferences and technological complexity;
- As a result of these phenomena, Visa and Mastercard are necessary commercial partners for most market participants of different categories, including: i) merchants, ii) acquirers and payment service providers (PSPs), iii) issuers and iv) providers of payment applications that use these card schemes' infrastructure (notably, digital wallets);
- In particular, acquirers/PSPs and merchants must accept both Visa and Mastercard; issuers must offer their customers at least one of the two.
- Visa and Mastercard are therefore likely to be in a position of superior bargaining power vis-à-vis their counterparts. Some market players, in particular issuers and digital wallets with large customer bases, may be particularly attractive commercial partners for ICS and may therefore have some countervailing buyer power. Digital wallets, in particular, while offering a complementary product that contributes to ICS business volumes, may also represent an actual or potential competitive threat;
- Consumers' preferences for ICS and their must-have status suggest that Visa and Mastercard are likely to have a non-contestable share of demand, i.e. a portion of online transactions where consumers would choose to pay through their cards regardless of what other payment methods they own and/or are available for check-out;
- ICS must-have status and position of superior bargaining power and their non-contestable share of demand have to be considered when assessing their conduct in the online payment sector;
- The stakeholder consultation and publicly available evidence – including information collected by competition authorities in other jurisdictions<sup>196</sup> – point to market conducts that, if implemented by Visa and Mastercard, may distort competition in online payments;
- This section aims at providing a framework to assess potential practices which may entrench ICS market power in online payments.

The term international card schemes (ICS) refers to players who offer payment networks operating at an international level, under which card-based payment transactions are executed.<sup>197</sup> ICS in the EEA are mainly American Express, Diners, Mastercard and Visa.

Card schemes are established players in the online payments sector and in the payment industry more broadly. This is a consequence of the popularity of payment cards among payment methods, which despite recent market developments are still widely used both directly and through digital wallets (see chapter 1 and section 3.3.1).

The success of cards is consistent with the structural features of the online payment sector. As discussed in section 3.3.1, payment cards have been around for a long time and, by the time e-commerce took off, many consumers already owned a payment card and were accustomed to use it as a payment method at physical POS.<sup>198</sup> Their traditional role in the offline payment sector virtually guaranteed cards a relevant position also in the online environment: as e-commerce expanded, it was natural for consumers to use cards to pay online and for merchants to accept them. This helped ICS building scale on both sides of their payment platform, with usage by consumers fostering acceptance by merchants, and vice versa, potentially generating a “moat” around their business.

High usage by consumers has contributed to high acceptance rates of payment cards by merchants:

- in 2024, 97% of the top 10 websites in the 14 selected countries accept credit cards and 80% of them accept debit cards;<sup>199</sup>
- 94% (16 out of 17) of the online merchants responding to our questionnaire accept credit cards and 82% (14 out of 17) accept debit cards.

With time, cards have increasingly been regarded as a secure payment method for online payments by consumers, further contributing to the success of this payment method (see section 3.2.1).

At the same time, high acceptance rates among merchants have boosted demand for cards by consumers.

These feedback effects contributed to making cards the most widely used payment method across the EEA (see Figure 3.1) and in several individual MS (see Table 1.6).

Among card schemes, international card schemes, and in particular Visa and Mastercard, have a role of particular prominence: all of the merchants responding to our questionnaire that reported to accept credit cards accept both Visa’s and Mastercard’s and nearly all of those accepting debit cards accept at least one of the two – 13 merchants accept Visa debit cards while 12 merchants accept Mastercard debit cards. Lower acceptance rates for debit cards may be attributable to the fact that Visa and Mastercard have been transitioning their former debit brands to the Visa Debit and Mastercard Debit networks, since the previous brands had limitations for e-commerce payments.<sup>200</sup>

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<sup>196</sup> In particular, the DOJ and the Turkish Competition Authority, as will be discussed in detail in the next sections.

<sup>197</sup> Precisely, in line with the IFR and as explained in chapter 1, a card scheme can be defined as a single set of rules, practices, standards and/or implementation guidelines for the execution of card-based payment transactions and which is separated from any infrastructure or payment system that supports its operation, and includes any specific decision-making body, organisation or entity accountable for the functioning of the scheme.

<sup>198</sup> The first instances of e-commerce date back to the 1970s and 1980s: in particular, in 1982 the first online marketplace, Boston Computer Exchange, opened for business. The advent of the World Wide Web in the 1990s, however, marks a significant turning point in the history of e-commerce, as testified by the launch of influential marketplace platforms such as Amazon and Ebay (sources: <https://healthcaremba.gwu.edu/history-of-e-commerce>, [https://en.wikipedia.org/wiki/Timeline\\_of\\_e-commerce](https://en.wikipedia.org/wiki/Timeline_of_e-commerce), <https://www.mayple.com/resources/ecommerce/history-of-ecommerce/>). In turn, payment cards started being widely used in the 1980s, thanks to the spread of the electronic payment terminals connected to the Visa and Mastercard networks (source: <https://www.mobiletransaction.org/history-of-credit-card-machines/>).

<sup>199</sup> Additional details on this analysis are provided in section 1.2.

<sup>200</sup> As for example explained by Mastercard as regards the dismissal of the Maestro brand.

The available evidence confirms that the observed close to universal acceptance of cards is related to high usage by consumers.

The majority of the merchants responding to our questionnaire indicated reach among users as the most relevant factor that renders Visa and Mastercard more attractive than other similar payment solutions; this factor seems to contribute to the attractiveness of the other ICS (American Express and Diners) to a much lesser extent.<sup>201</sup>

Data on the share of e-commerce card transactions attributable to Visa and Mastercard confirms higher usage of these networks: according to Capgemini estimates, the median values of their shares of e-commerce card transactions are 45% and 53%, respectively, in 11 of the 14 selected countries.<sup>202</sup> The role of American Express and Diners, on the contrary, seems negligible.

One of the drivers of the success of Visa and Mastercard is the fact that they are large, global firms: as noted in the previous sections, scale brings about a competitive advantage in the online payment sector, making fixed investments less burdensome; making it more convenient to other market players to adapt to the technical standards set by their largest large commercial counterparts; contributing to the creation of brands that are perceived as secure. Since merchants value consumer reach and consumers value wide and cross-border acceptance, these effects are mutually reinforcing.

In addition, Visa and Mastercard are much more widely used than other ICS, in particular American Express and Diners. The last two rely on a different acquiring and issuing model (see Box 4.1), which contribute to higher acceptance costs for merchants. In addition, American Express and Diners typically target wealthy consumers, offering benefits (e.g. loyalty rewards programs) at a higher cost. These factors limit comparability between Visa and Mastercard, on the one hand, and American Express and Diners, on the other hand, and contribute to the greater usage and acceptance of Visa and Mastercard.

As a result of the competitive dynamics described above, Mastercard and Visa are widely regarded as must-have payment methods by consumers and online merchants.

The results of the consumer survey suggest that, on average, 64% of consumers in the selected countries own a payment card, making cards the most widespread payment method among respondents, together with Paypal<sup>203</sup> (see Table 2.7);<sup>204</sup> and that nearly all

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<sup>201</sup> Out of 14 responding to this question, 10 merchants indicated that reach among users makes Visa and Mastercard more attractive than similar payment solutions; this factor was considered a relevant determinant of the attractiveness of American Express and Diners by 4 merchants and 1 merchant, respectively.

<sup>202</sup> It was not possible to provide a quantitative indication of the role of Visa and Mastercard in France, Germany and Italy, where co-badging of domestic schemes with ICS is widespread and the available data does not allow to determine the network to which transactions through co-badged cards should be attributed.

<sup>203</sup> From Figure 2.33, online banking payment methods are the most widely owned option by the consumer survey respondents. It should be noted, however, that the online banking category encompasses multiple payment methods, including both credit transfers and applications relying on credit transfers (e.g. iDEAL, Bizum). The spread of each individual payment method in the online banking category across the EEA is lower than that of payment cards and Paypal, as can be inferred from Table 2.7.

<sup>204</sup> This may be an underestimation of the share of respondents that own a payment card, since the survey question asked to report only the payment methods that the respondents have used to make online purchases.

of these consumers (96% on average across the 14 selected countries) own a card with one of the Visa and Mastercard brands (Maestro, Mastercard, V-Pay, Visa).<sup>205</sup>

The consumer survey results also suggests that, when consumers only own one payment method (18% of the sample, see Figure 2.31<sup>206</sup>), in about one third of the cases the payment method they own is an international card (see Figure 2.33): for the reasons explained in section 2.3.1.2.2, however, this is likely an underestimation of this phenomenon, due to potential biases in the survey responses;<sup>207</sup> in addition, 26% of consumers owning only one payment method reported they also frequently use ICS cards.<sup>208</sup>

It should be noted that the figures mentioned above are averages across the selected countries and are the result of a mix of preferences across countries. For example, the share of consumers owning only one payment method that frequently use ICS cards (26%) is driven down by the results observed in countries where either Paypal or a local online banking solution are particularly popular.<sup>209</sup> Conversely, in certain countries (Greece, France and Spain) this share is significantly higher and above 45%.

Finally, a significant portion of consumers that own multiple payment methods seem to have a preference for ICS. According to the results of the experiment, 29% of the consumers in the sample display a strong preference for one payment method and rarely deviate from it (Figure 2.31).<sup>210</sup> The payment methods most frequently owned by these consumers are ICS cards, Paypal and online banking applications (Figure 2.33) but 41% of them reported the only payment method they frequently use is ICS cards. This share is considerably higher than that of these consumers – i.e. never switchers by choice – that frequently use the other two payment methods.<sup>211</sup>

The latter results have important implications for the competitive dynamics in the sector: it follows, indeed, that a share of the demand is non-contestable for Visa and Mastercard. In particular, consumers may choose to pay through Visa and Mastercard cards regardless of what other payment methods are available; and/or, in light of their vast acceptance

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<sup>205</sup> See Figure 2.25. In addition, 66% of the respondents owning a credit or debit card reported they own a Mastercard card and 62% reported they own a Visa card. These percentages at the country level are obtained as the sum of the grey and purple portions of each bar for Visa; and of the grey and orange portions of each bar for Mastercard.

<sup>206</sup> These consumers have been defined never switchers with no capacity in chapter 2.

<sup>207</sup> 25% of respondents, indeed, reportedly only own Paypal which suggests that their responses to some of the questions must be erroneous. Paypal, indeed, must be linked to other payment method (either cards or bank accounts) to be used for e-commerce. Therefore, respondents must have either misremembered they own the linked payment method or never used Paypal for e-commerce, which was a requirement of the survey question.

<sup>208</sup> As explained in section 2.3.1, frequency of usage is defined based on the replies to the survey question “E5a. You mentioned you own the following payment methods. Please indicate how frequently you use each method, whose response options were placed on a Likert scale of 1 to 5, where 1 means ‘almost never’, 2 means ‘rarely’, 3 means ‘occasionally’, 4 means ‘frequently’ and 5 means ‘almost always’”. In particular, respondents are considered frequent users of a payment method if they have selected option 4 or 5 for that payment method in the above question.

<sup>209</sup> In particular, Germany, Latvia and the Netherlands, where the share of never switchers with no capacity which frequently use ICS are 6%, 6% and 1%, respectively.

<sup>210</sup> These consumers have been defined never switchers by choice in chapter 2. More precisely, these are consumers that have access to multiple payment options but rarely deviate from their preferred option, as can be inferred by the fact that they reported they frequently use only one payment method.

<sup>211</sup> Equal to 17.5% and 28.5% for Paypal and online banking solutions, respectively.

network, they may choose to pay through Visa and Mastercard cards because their preferred payment method is not an available option.

Relatedly, the vast majority of the merchants surveyed by the Project Team consider ICS cards as must-haves. In particular:

- 87,5% (14 out of 16) and 81,25% (13 out of 16) of the respondents consider Visa and Mastercard credit cards as must-haves, respectively;
- the share of merchants considering Mastercard and Visa debit cards as must-have payment methods is lower and equal to 62,5% (10 out of 16) for both.
- the results of the questionnaire suggest that both Visa and Mastercard are generally regarded as must-haves.<sup>212</sup>

The fact that the share of merchants regarding Visa and Mastercard debit cards as must-haves is lower than that of Visa and Mastercard credit cards is likely explained by lower usage of debit cards for online transactions with respect to credit cards in the EEA overall (see Table 1.6).

The additional competitive constraint represented by domestic schemes for debit card transactions may also contribute to this finding. Domestic card schemes include Girocard (Germany), Bancomat (Italy), Cartes Bancaires (France), Bancontact (Belgium), Dankort (Denmark) and Scheme MB (Portugal): most of them only operate as debit networks.<sup>213</sup> There is no evidence, however, that the market power of Visa and Mastercard in the debit segment is more limited for this reason. From the results of the questionnaire, it does not seem that domestic cards replace Visa and Mastercard cards as must have debit cards: all of the respondents that regard domestic debit cards as must-haves also consider Visa and Mastercard debit cards as must-haves. Nevertheless, the competitive constraint represented by domestic schemes may still represent a relevant driver of Visa's and Mastercard's market conduct.

Visa and Mastercard are therefore necessary "commercial partners" for the majority of market participants of different categories, including: i) merchants, ii) acquirers and payment service providers (PSPs),<sup>214</sup> iii) issuers (both banks and neo-banks), iv) providers of payment applications that use these card schemes' infrastructure (notably, digital wallets). Merchants' relationship with ICS is typically indirect, and intermediated by their acquirers. Exceptionally, however, large merchants may also have direct relationships with ICS: for example, a large merchant replied to the Project Team's questionnaire explaining that, other than having relationships with PSPs such as Ptech and Stripe that manage their Visa and Mastercard transactions, they also directly negotiate with ICS.<sup>215</sup>

ICS may be in a position of superior bargaining power *vis-à-vis* most of these players.

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<sup>212</sup> In particular, there is only one merchant that regards Visa credit cards as a must-have, but not Mastercard's. In all other instances, the merchants responding to the questionnaire have indicated that they consider *both* Visa and Mastercard as must-haves.

<sup>213</sup> Except for Groupement des Cartes Bancaires, the French card scheme.

<sup>214</sup> Traditionally, acquirers were banks or financial institutions accepting credit and debit card payments on behalf of merchants, facilitating the authorisation and settlement of transactions between the merchant and the issuing bank and handling the transaction risk. In the past decade the role of acquirers has increasingly been absorbed by industry players (e.g. Adyen, Stripe) that provide a wider range of services to merchants on top of acquiring services, including gateway and processor functionalities, and accepting a wider range of payment methods other than cards.

<sup>215</sup> This is consistent with the overview of business model of PSPs provided in section 1.4.

Merchants cannot afford not to accept Visa and Mastercard cards as this may increase consumer abandonment rates and cause losses to their business. The consumer survey results, indeed, reveal that 74% would rather restart the purchasing process on another website than register for a new payment method. Acquirers' and PSPs' demand reflect merchants' and consumers' preferences: considering that acquirers and PSPs monetize their services through transaction fees, they must support *both* Visa and Mastercard, otherwise they may be losing a considerable share of online transactions – especially in light of the fact that Visa and Mastercard are likely to hold a non-contestable share of the demand. The replies to our questionnaire of two providers of acquiring services, which will be further discussed in the next section, are consistent with this assumption. Issuers' demand in turn reflects consumers' demand: issuers must offer Visa *or* Mastercard cards; importantly, however, they do not necessarily need to issue *both* brands to be competitive and this may give them some degree of countervailing bargaining power *vis-à-vis* card schemes. Finally, card-based payment applications (e.g. digital wallets) that do not allow their consumers to upload the main ICS cards to their applications will be prevented from reaching a considerable portion of the demand.

Their must-have status and position of superior bargaining power have to be considered when assessing Visa and Mastercard conduct in the online payment sector.

The stakeholder consultation and publicly available evidence – including information collected by competition authorities in other jurisdictions<sup>216</sup> – point to market conducts that if implemented by Visa and Mastercard in the EEA may be anticompetitive. For example, there is a concern among the stakeholders surveyed that ICS may be able to impose increases in the fees that acquirers (and, as a consequence, merchants) pay without losing significant portions of demand: as will be discussed in section 4.1.1, to the extent that these increases are excessive, this conduct could be considered exploitative.

ICS may also be able to impose non-compete clauses or other clauses aimed at obtaining a preferential treatment (e.g. in terms of display) or to propose deals that cannot be replicated by their competitors (e.g. volume rebate schemes), as they leverage their non-contestable share of demand: such practices could have the intent or effect of foreclosing rivals. Section 4.1.2 is dedicated to discussing ICS' ability and incentives to engage in exclusionary practices.

The concern is that the main ICS may exploit their market and bargaining power to prevent, restrict or distort competition with i) other card schemes, including domestic schemes for domestic transactions, and ii) alternative payment systems, i.e. payment methods that are based on payment services other than cards.

Before describing in detail the behaviour that ICS may implement to this end, it is useful to briefly describe the functioning of card schemes, the main players involved in card-based online transactions and their monetization strategies: the overview provided in Box 4.1 provides a basic understanding of their economic incentives; it also allows to identify the leverages that card schemes have at their disposal to influence their commercial partners' behaviour and/or to favour certain specific partners, possibly altering market outcomes.<sup>217</sup>

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<sup>216</sup> In particular, the DOJ and the Turkish Competition Authority, as will be discussed in detail in the next sections.

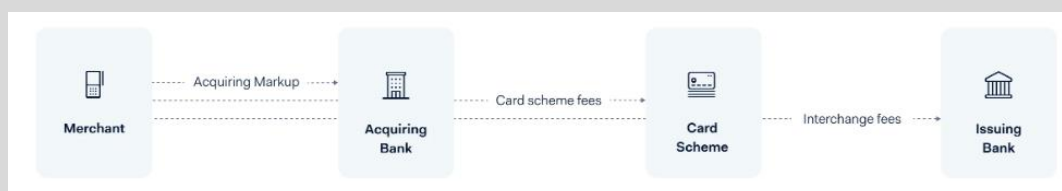
<sup>217</sup> Additional details on pricing structures are also provided in section 1.4.

**Box 4.1: The functioning of card schemes and their sources of revenues**

Card schemes are involved in all card-based online transactions, although their role differs based on the type of card scheme. The largest card schemes (Visa and Mastercard) in the EEA operate based on the so-called 4-corner model, where their relationship with consumers and merchants is intermediated by the issuing and acquiring banks, respectively: the issuing bank provides the card to the payer, the acquiring bank accepts the card payment on behalf of the payee. The issuing and acquiring banks can therefore be regarded as commercial partners for the card schemes they adhere to, allowing consumers to pay through their payment cards and merchants to accept such payments. In 3-corner card schemes (e.g. American Express and Diners) the scheme itself provides acquiring and issuing services.<sup>218</sup>

Behind any card transaction, including those through digital wallets, card schemes collect fees from the merchant's acquiring bank: card scheme fees, which are retained by the card scheme, and the interchange fee, which is transferred by the card scheme to the issuing bank and remunerates the issuing bank.

Acquirers charge merchants a fee which is typically referred to as merchants service charge (MSC) and reflects: i) the interchange fee, ii) the scheme fee (at least partially) and iii) an additional fee to remunerate the acquirer, as depicted in Figure 4.1. Interchange fees are always passed on to merchants, which cannot negotiate MSCs below the level of interchange fees (so-called floor effect).

**Figure 4.1: The flow of fees in a card transaction**

Source: Adyen

Scheme fees are also collected by the card scheme from issuing banks. Card schemes, however, often grant incentive payments and rebate on scheme fees to issuers, which partially offset the scheme fee. The extent of such rebates and incentives is likely to vary significantly across individual issuers, based on their bargaining power, which in turn depends on their customer base.

The taxonomy of scheme fees is complex and, on top of the above fees, which regard mandatory or core services, card schemes charge additional fees that are part of scheme fees.

Card schemes also charge scheme fees to issuers and acquirers for optional, complementary services they provide: such optional services include acquirer 3DS authentication services.<sup>219</sup>

Card scheme operators may also charge behavioural scheme fees, which are intended to disincentivise specific behaviours from acquirers, issuers or merchants, or to

<sup>218</sup> See Table 1.3 for a comprehensive definition of four- and three-party card schemes.

<sup>219</sup> For a comprehensive overview of the optional services provided by Visa and Mastercard, see the Interim Report of the Market review of card scheme and processing fees, published by the PSR in May 2024, available [here](#).

incentivise them to adopt specific technical solutions. For example, a large merchant reported in the questionnaire that ICS impose fines or penalties for sending a transaction through PAN instead of Token, or for not using 3DS rails in spite of being compliant with exemptions regime in their view.

Further details on the pricing models adopted by card schemes are provided in section 1.4.

Source: Project Team

#### 4.1.1. Pricing conduct of possible exploitative nature

Article 102 of the TFEU provides that “*directly or indirectly imposing unfair purchase or selling prices or other unfair trading conditions*” constitutes an abuse of dominant position. Under EU case law, “excessive pricing” – albeit rare – falls under the scope of article 102.

The case law also clarified that ascertaining excessive pricing requires to determine the extent to which prices have “*no reasonable relation to the economic value of the product supplied*”.<sup>220</sup>

The structural features of the online payment sector may give Visa and Mastercard the ability and incentive to engage in pricing conduct of exploitative nature. As discussed above, indeed, the characteristics of the online payment sector have granted *both* Visa and Mastercard a position of superior bargaining power, which implies that an increase in fees would be unlikely to trigger a reduction in demand by acquirers. According to economic theory, indeed, the threat that a considerable portion of the demand could switch to rivals – either actual or potential – should represent a disciplining mechanism disincentivising dominant undertakings from applying excessive prices. The underlying assumption, however, is that the demand faced by the dominant firms is elastic to prices. For the reasons discussed above, acquirers’ demand is likely to be largely inelastic to the fees charged by card schemes, suggesting that the above disciplining mechanism is likely to fail in the context of the online payment sector.

The stakeholders that have contributed to our consultation revealed some concerns about potentially anticompetitive pricing conduct by ICS.

Two anonymous providers of payment applications responding to our questionnaire, which are also providers of acquiring services, complained about increases in scheme fees, behavioural fees and fines imposed by ICS, specifically referring to Visa and Mastercard, saying that they have little-to-no negotiation power as they have no choice but accept their cards.<sup>221</sup> One of the two also argued that the fee structure and the fee-setting process is not transparent.

Publicly available evidence supports the existence of an increasing trend in scheme fees. A 2024 study on recent developments in card-based payment markets carried out by Vicari *et al.* on behalf of the European Commission<sup>222</sup> argues that scheme fees imposed by ICS

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<sup>220</sup> Case 27/76 United Brands Company and United Brands Continental v Commission, ECLI:EU:C:1978:22, paragraph 250.

<sup>221</sup> The first acquirer noted, in particular, that “acquirers have little or no negotiation power as they have no option but to accept Visa *and* Mastercard badged cards”; similarly, the second acquirer reported that “[a]cquirers have little to no influence over the fees and fines imposed, as they must accept Visa *and* Mastercard-branded cards to meet consumer demand” (emphasis added).

<sup>222</sup> Available [here](#).

per average card transaction have increased in the period 2018-2022, based on qualitative information collected from payment industry and merchants' associations.<sup>223</sup>

Quantitative evidence that the scheme fees charged by Visa and Mastercard have increased is provided by the PSR for the UK: in particular, an ongoing market review of scheme and processing fees by the PSR suggests that overall fee levels charged to acquirers by Mastercard and Visa over the period 2017-2021 have increased by more than 30% in real terms.<sup>224</sup> While such evidence concerns the UK only, one acquirer that participated in the Vicari *et al.* (2024) study mentioned above reported that the situation they face in Europe regarding ICS pricing conduct is similar to that in the UK.

In any case, such increases may have other explanations than the exercise of market power through the imposition of excessive prices, and the available evidence is not sufficient to reach any conclusion.

As noted above, to understand whether increases in fees may reflect an abusive conduct it would be useful to assess whether they are related to an increase in "*the economic value of the product supplied*".

One anonymous merchant complained that ICS (Visa, Mastercard, American Express and Diners) make them and their customers pay "*more than needed*". The preliminary findings of the ongoing PSR study suggest that there is no clear link between the observed increases in fees and changes in service quality. This was also the perception of one acquirer participating in the Vicari *et al.* (2024).

The card schemes consulted by the Vicari *et al.* (2024) study, however, argue that the rise in scheme fees is due to a combination of new regulatory requirements and new players joining the market, both of which required additional measures to enhance security and prevent fraud risks.<sup>225</sup> This argument was questioned by other stakeholders contributing to the study, who claimed that if such increases were meant to recover the investments needed to comply with the new standards, they should have been temporary. The Vicari *et al.* (2024) study also documents that domestic schemes fees have increased over the same period, suggesting that there may be reasons unrelated to the ICS' market power that justify such trend.

Further evidence would therefore be needed to assess whether the observed increases in scheme and behavioural fees may be exploitative.

If evidence of exploitative pricing conduct is found, this could result in harm for merchants and consumers, as these additional fees/costs may ultimately be passed on to them. In addition, excessive pricing may harm acquirers, if they absorb a part of the increase in fees. Which group of economic agents is harmed and to what extent will depend on the ability of acquirers and merchants to pass the increases in fees onto their customers (merchants and consumers, respectively).

The two providers of payment applications that complained about these increases in our questionnaire also reported that these limit their ability to innovate and invest in expanding

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<sup>223</sup> The authors of the study launched a survey of card schemes, but the ICS did not provide information on their scheme fees.

<sup>224</sup> The PSR work builds *inter alia* on a previously published review of the card-acquiring market, which found that scheme fees paid by acquirers had increased significantly over the period 2014-2018.

<sup>225</sup> Examples included card credential tokenization and EMV 3DS.

acceptance. This would suggest that they at least partially absorb the reported increases in fees, although they did not provide any explanation of the driver of the alleged harm.

Acquirers' ability and incentives to pass increases in fees onto merchants – and the extent of the possible pass-on – will depend on a combination of the following factors:

- the elasticity of the demand faced by acquirers;
- acquirers' ability to negotiate discounts on scheme and behavioural fees with ICS and the level of competition in the market for acquiring services;
- merchants' ability and willingness to switch acquirers;
- the type of pricing model adopted by acquirers, and the type of fees for which there is an increase (scheme fees, behavioural fees or fines).

The must-have status of Visa and Mastercard suggests that merchants' demand for acquiring services for Visa and Mastercard cards is likely to be largely inelastic with respect to the prices charged by acquirers for acceptance of Visa and Mastercard card payments.

However, if the increases in fees do not affect all the acquirers in the market in the same way and merchants can freely switch acquirers – i.e. they are not contractually linked to theirs for a given period of time and they bear no costs for switching – acquirers' incentives to pass increases in fees on to merchants may be limited. If acquirers manage to obtain individually negotiated discounts or rebates on their fees from Mastercard and Visa, this would give them a competitive advantage over rivals in the acquiring market. If competition among acquirers is intense,<sup>226</sup> this could limit the incentive for the acquirers faced with the highest fee levels to fully pass them on to merchants, as they might lose customers over their rivals obtaining better conditions. While in principle scheme fees are individually negotiated between acquirers and card schemes, there is no evidence on the frequency and extent of such discounts in the EEA. The PSR ongoing market review suggests that in the UK individually negotiated discounts or rebates are very uncommon.<sup>227</sup>

Finally, the type of pricing model adopted by acquirers, and the type of fees for which there is an increase (scheme fees, behavioural fees or fines) may also play a role on the effectiveness of such potential practice. Box 4.2 illustrates the main pricing models adopted by acquirers.

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<sup>226</sup> Competition, indeed, drives prices towards marginal costs. For example, in a scenario in which the market for Visa and Mastercard acquiring services is perfectly competitive and all acquirers face the same increase in fees, the pass-on rate of such increases would virtually be 100%.

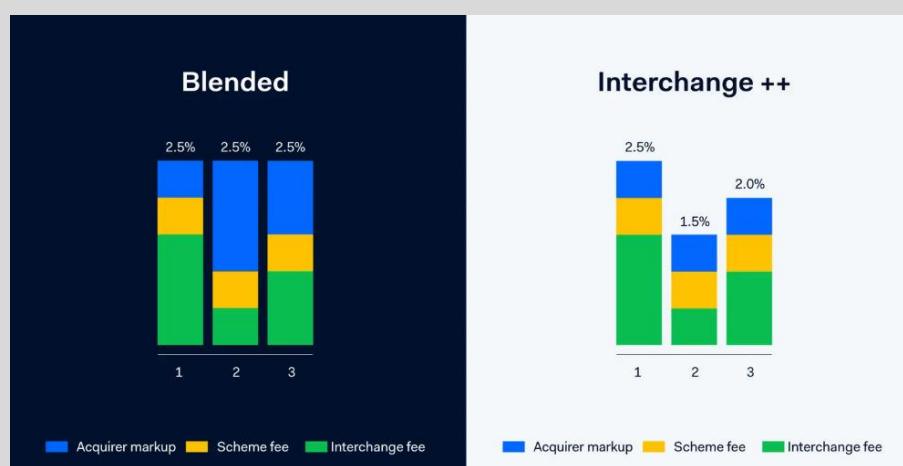
<sup>227</sup> In particular, the PSR launched a consultation and found that the vast majority of the acquirers that participated reported they were unable to negotiate reduced fees in the five years analysed.

**Box 4.2: The most widely used acquiring pricing models**

Interchange++ (or Interchange Plus Plus) and blended are the most widely used pricing models for card transactions:

- the Interchange++ (IC++) pricing shows merchants a detailed breakdown of the three payment card costs described above: the acquirer markup, card scheme fee and interchange fee. This pricing implies that for any given transaction an acquirer automatically passes through at the time of the transaction (at cost) all the fees applicable to that transaction;
- the blended pricing model charges merchants an average processing cost plus a fixed markup. Merchants are charged the same markup for every transaction, and they cannot see the split of the costs. In some cases, the merchant pays a fixed, periodic fee for card-acquiring services (fixed pricing), in other cases the merchant pays a headline rate and, potentially, some additional rates based on the characteristics of the transaction (standard pricing).

**Figure 4.2: Example of blended v. interchange ++ pricing model**



Source: Adyen

Source: Project Team

The IC++ allows acquirers to automatically pass through any per-transaction cost increase, thus including scheme fee increases, but not behavioural fees and fines that are not charged per transaction. When acquirers adopt blended rates, instead, they are unable to immediately pass through scheme fee increases: these contracts, indeed, are characterised by fixed rates. However, by adjusting the blended rates they offer merchants,<sup>228</sup> acquirers may be able to recoup the costs incurred due increases in both scheme fees and behavioural fees and fines.

The stakeholder consultation, Vicari *et al.* and PSR study all point to lack of transparency in the ICS fee structure. One implication of such lack of transparency is that acquirers may be unable to identify the specific transactions and merchants responsible for triggering behavioural fees or fines, as argued by the acquirers participating in the PSR study. As a

<sup>228</sup> Either for new contracts or upon renewal of existing contracts.

result, acquirers may be unable to pass on the increase in behavioural fees to the merchants who triggered them.

However, they may find it profitable to respond to increases in behavioural fees by raising prices – for example by adjusting the blended rates they offer merchants. This strategy is more likely to be profitable if merchants are unwilling or unable to search for alternative providers.

In this scenario, merchants with blended contracts may be harmed by increases in behavioural fees and fines even if they are not responsible for them.

Vicari *et al.* find that, in a sample of 61 merchants from 11 EU countries,<sup>229</sup> the majority of merchants surveyed (61%) receive an unblended fee schedule, while 30% have opted for a blended schedule.<sup>230</sup> The sample size on which these estimates are based is, however, limited. The study also suggests that unblended pricing models are more common among large merchants, in line with evidence provided by two industry associations interviewed by the Project Team and with the findings of the PSR.<sup>231</sup> Small and medium-sized merchants would therefore be more likely to be harmed by increases in behavioural fees imposed by ICS.

Importantly, if acquirers are unable to identify the merchants that triggered behavioural fees, it is unlikely that behavioural fees are working to incentivise the intended behaviour of the specific merchant within the card payment ecosystem: this might be considered an indication that the increases in behavioural fees, if any, may have an exploitative intent.

#### **4.1.2. Agreements and partnerships of possible exclusionary nature**

Visa and Mastercard have superior bargaining power *vis-à-vis* their contractual counterparts: merchants, acquirers and PSPs, issuers, digital wallet providers.

In addition, their must-have status and consumer preferences for ICS suggest that both Visa and Mastercard are likely to have a non-contestable share of the demand: such share could represent a further leverage in their negotiation with merchants and their acquirers or PSPs, as well as with digital wallet providers.

The factors outlined above may pave the way to practices that – if implemented – may entrench the position of Visa and Mastercard and shape the competitive dynamics in the online payment sectors. These practices may include:

- non-compete contractual clauses, requesting merchants and acquirers or PSPs not to accept competing payment methods. Similarly, digital wallet providers – and, to a lesser extent issuing banks – could be asked not to support competing payment methods;
- contractual clauses mandating a preferential treatment for ICS with respect to their rivals (e.g. through a more favourable display by merchants, or through prioritization by merchants and/or digital wallet providers of ICS' payment application in transactions through co-badged cards).

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<sup>229</sup> CZ, DK, FR, DE, EL, IE, IT, NL, PL PT, SE.

<sup>230</sup> The remaining merchants surveyed did not know which type of contract they have in place.

<sup>231</sup> However, the PSR finds that, in the UK, the vast majority of merchants are not on IC++ contracts, with over 95% having standard pricing.

Competition authorities in other jurisdictions have raised concerns that ICS may be able to propose volume rebate schemes to merchants and their acquirers or PSPs, whereby these players are granted financial incentives past a certain threshold in terms of transaction volumes. In exchange for these incentives, ICS may be able to obtain a preferential treatment without contractually imposing it.

To the extent that accepting such conditions is a necessary condition to contract with them, or that the financial benefits ICS grant to their commercial counterparts are not replicable by competitors, these practices could harm (i) other international card schemes, (ii) domestic card schemes, (iii) providers of alternative, non-card based payment methods by depriving them of sufficient scale to compete effectively, and may represent a violation of article 102 of the TFEU.

Competition authorities in other jurisdictions have made allegations about the implementation of some of the above practices by Visa and/or Mastercard (in particular, non-compete clauses and potentially anticompetitive rebate schemes) – albeit all these investigations are at an early stage. As it will be further discussed below, our stakeholder consultation provides indication – although limited and not conclusive – that there is indeed a concern among market participants that the conduct of ICS may fall within the above practices.

Below, we analyse in detail the strategies that ICS may implement, identifying under which conditions they may be anticompetitive, starting from those that concern ICS' relationship with merchants and their acquirers or PSPs, then moving to potential strategic partnerships between ICS, digital wallets and issuing banks.

This chapter does not aim to provide conclusive evidence regarding the existence of such practices, but rather to establish a framework for assessing the competitive implications of conducts that ICS status would enable them to implement. Conducts have been identified based on the concerns shared by the surveyed stakeholders and the allegations made by competition authorities in other jurisdictions.

#### **4.1.2.1. Agreements with merchants, their acquirers or PSPs**

ICS may leverage their position of superior bargaining power *vis-à-vis* merchants and their acquirers or PSPs to secure agreements that help them maintain or reinforce their market position. This could be achieved through specific contractual provisions that result in a higher share of transactions processed through ICS' networks.

Below, we describe in detail how such agreements could be designed in practice and their potential effects on competition in online payments, distinguishing between cases in which ICS directly negotiate with merchants and cases in which they negotiate with acquirers or PSPs. The scenarios discussed reflect the concerns raised by allegations made by competition authorities in other jurisdictions and by the stakeholders surveyed, which are discussed later in this section; a discussion of market practices which are similar in nature to those investigated by other competition authorities is also included.

If Visa and Mastercard directly negotiate with merchants, their status may enable them to impose the following contractual conditions:

- non-compete clauses, requesting merchants not to accept competing payment methods. Through such clauses, ICS may target specific competitors;<sup>232</sup>

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<sup>232</sup> Allegations of the implementation of similar practices have been made by the Turkish Competition Authority in a recently opened investigation, as will be discussed later in this section.

- clauses mandating a preferential treatment for ICS with respect to their rivals. In particular, ICS could request a more favourable display on check-out pages; or prioritization of their network in transactions through co-badged cards.<sup>233</sup>

If implemented, such practices would be detrimental for i) other card schemes and ii) providers of payment methods relying on alternative payment rails, since they would have the effect of limiting their scale.

Their must-have status could encourage Visa and Mastercard to engage in such practices: merchants and acquirers or PSPs are indeed virtually obliged to accept both of them; there is therefore close to no chance that they would lose customers by imposing conditions like the ones described above.

Alternatively, the DOJ allegations suggest that ICS might offer volume discounts to merchants (e.g. in the form of lower scheme fees<sup>234</sup>) whose volume of transactions through their networks exceeds a certain threshold. More precisely, ICS could adopt retroactive rebate schemes: past a certain volume threshold, the merchant would benefit from the discount on *all* its transactions through the network.<sup>235</sup>

Such rebate schemes could have the same effect on competition as the contractual clauses described above. The merchant, indeed, would have the incentive to divert its transactions to the ICS network to meet the volume threshold that triggers the discount. To achieve this, merchants could favour ICS by displaying them more prominently; could prioritize the ICS in case of transactions through co-badged cards; or could decide to accept a lower number of competing payment methods, even if such actions are not explicitly required by their agreements with ICS.

To the extent the overall discounts or financial benefits merchants receive from ICS cannot be matched by competing payment methods, the latter could ultimately be driven out of the market.

This type of retroactive conditional rebate schemes raises competitive concerns if the firm that implements it has a significant non-contestable share of the demand. In such cases, the rebate scheme could prevent rivals of dominant firms from competing effectively for the contestable portion of demand. To be competitive and attract customers, indeed, rivals should not simply match the prices applied by the dominant firms following the application of discounts; they should also compensate merchants for not obtaining the discount on non-contestable transactions. This may be unfeasible even for a rival that is as efficient as the dominant firm, especially if non-contestable transactions are sizeable.

As discussed above in this section, direct agreements between merchants and ICS are rare, especially in the case of four-party card schemes. In most cases, their relationship is intermediated by acquirers or PSPs.

When acquirers or PSPs are involved in the relationship between ICS and merchants, it becomes challenging to predict whether ICS can effectively implement certain practices.

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<sup>233</sup> The stakeholder consultation – and, in particular, responses by two merchants and two providers of payment applications – provides some limited indication that ICS may be able to obtain a more favourable treatment in terms of display by merchants.

<sup>234</sup> Including for additional services (see Box 4.1).

<sup>235</sup> The DOJ alleges that Visa leverages conditional rebate schemes in their agreements with merchants and/or acquirers in the US.

For example, ICS could try to pressure acquirers or PSPs to encourage merchants to prioritize their payment methods, but this would only be effective if most acquirers comply.

The practices outlined above – if implemented and effective – would ultimately strengthen ICS market position and prevent alternative payment methods from achieving the scale needed to effectively compete in these markets.

The Turkish Competition Authority (TCA) has recently opened an investigation that concerns Visa's alleged non-compete clauses in its agreements with merchants. More precisely, the TCA alleges that Visa's agreements with merchants include obligations that prevent these businesses from accepting competing service providers.<sup>236</sup>

In addition, our stakeholder consultation provides indication that ICS may be able to influence the display of payment options in merchants' check-out pages, through contractual conditions that PSPs impose to merchants:

- one anonymous merchant from the Netherlands indicated they have contractual arrangements with their PSP (Adyen) which include clauses regarding the display of Visa at checkout, specifying that such clauses were imposed as necessary for signing the contract;
- One merchant also noted that their contractual arrangements with their PSPs<sup>237</sup> include clauses regarding the display of ICS at checkout which were imposed as necessary for signing the contract. The merchant further specified that these clauses are enforced by PSPs to comply with card schemes' requirements;<sup>238</sup> and that card schemes require equal treatment, rather than a preferential treatment. The merchant further noticed that this limits their ability to optimize the display of payment options based on their preferences;
- two providers of payment applications have indicated that ICS cards are displayed in a more favourable way (through defaulting and/or show more banners). In principle, the mere observation that merchants display more favourably ICS is not indicative of the presence of an underlying agreement with ICS, as it may be the result of merchants' preferences: however, in light of the fact that there are cheaper alternatives for merchants (e.g. A2A payment solutions and domestic schemes), this explanation does not seem convincing. Merchants may be instead obliged or incentivized by ICS – either directly or through provisions imposed by acquirers/PSPs – to favour their cards.

As shown in chapter 2, display practices may be capable of altering consumer choice of payment methods. Their effectiveness is highly context-dependent, varying based on the type of display practice and characteristics and preferences of the specific consumer. However, some patterns in the results of the behavioural experiment suggest that display practices may be effective especially when they nudge consumers to pay through cards.<sup>239</sup>

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<sup>236</sup> <https://www.mondaq.com/turkey/antitrust-eu-competition/1550828/the-turkish-competition-authority-investigates-visa-and-mastercard-for-alleged-exclusionary-practices->.

<sup>237</sup> The merchant reported to have contractual relationships with multiple PSPs (Chase, Adyen and Worldpay) for the management of their ICS transactions.

<sup>238</sup> More precisely, the stakeholder noted that "*PSPs have broad statements regarding compliance with card schemes.*"

<sup>239</sup> More precisely, when the display practices in the experiment favoured a credit or debit card, Big Tech wallet, or Paypal, higher rates of switching were found compared to when they favoured other payment methods. For defaulting, in particular, credit and debit cards seem to be the most effective at eliciting the most switching.

If ICS are able to incentivise merchants to give them a more prominent display, they may thus effectively distort competition.

The implementation of display practices favouring ICS is not a source of competitive concern per se. However, if they are a necessary condition for engaging with ICS, or if ICS provide financial benefits to merchants and/or acquirers in exchange for such preferential treatment which are not replicable by competitors, competition may be harmed. In particular, other card schemes and providers of alternative, non-card-based payment methods may be deprived of sufficient scale to compete effectively.

As noted above, final incentives to merchants and acquirers/PSPs could be part of volume rebate schemes.

The DOJ alleges that in the US Visa grants rebates to merchants and/or acquirers, conditional on their total volumes exceeding a committed threshold. More precisely, according to the DOJ: *"Visa leverages its control over non-contestable transactions and extracts routing deals that limit competition for contestable transactions. Absent a routing agreement, the merchant or acquirer pays a list price (known in the industry as the rack rate) on any transaction that is routed to Visa's debit network. Alternatively, the merchant (or acquirer) signs an agreement with Visa and receives a so-called 'discount' on all transactions, both non-contestable and contestable. Visa threatens punitive rack rates if merchants (or their acquirers) route a meaningful share of their transactions to Visa's competitors"* (DOJ complaint, paragraph 12). In particular, Visa adopts so-called "cliff pricing", whereby it *"grants the merchant or acquirer a lower price for every transaction routed to Visa so long as its total volume of transactions exceeds the committed threshold. If the merchant does not meet the commitment, Visa will impose its high rack rates on all transactions routed to Visa"*. According to the DOJ, this strategy allows Visa *"to discourage merchants from routing to Visa's competitors, denying them scale"* (DOJ complaint, paragraph 78).

The conditional rebate schemes challenged by the DOJ raise antitrust concerns since they would allow Visa to win customers over its competitors by proposing deals that leverage the non-contestable segment of the demand and that their competitors can therefore not match.

It should be noted, however, that the conduct investigated by the DOJ is tailored to some specificities of the US payments market. In particular:

- the DOJ finds that, in the US, Visa's share of card-not-present debit transactions exceeds 65% and *"Mastercard is a distant second"* (DOJ complaint, paragraph 6). In the EU, Mastercard is not a distant second. As already discussed, it can be estimated that Visa's and Mastercard's share of e-commerce cards' transactions are equal to 45% and 53%, respectively, in 11 of the 14 selected countries;<sup>240</sup>
- in the US, the Durbin Amendment requires issuing banks to include at least two debit networks on every debit card since 2010 and the merchant is given the choice of debit routing (i.e. which network to use): the "routing deals" identified by the DOJ should be analysed with this context in mind, where merchants directly get to choose the debit network to be used in each debit card transaction (at least in the contestable ones);
- Visa is found to have significant non-contestable transactions, i.e. transactions for which Visa faces no competition from the other card network in its cards, which gives

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<sup>240</sup> Based on Capgemini estimates.

Visa the leverage to implement this practice. Several factors contribute to this finding, including the following:

- the back-of-card networks may not be available for particular transaction types, such as transactions over a certain dollar amount or transactions that fail to meet particular encryption criteria;
- acquirers may not enable smaller networks.

While the above differences should be carefully considered, they do not necessarily suggest that Visa and/or Mastercard cannot successfully implement similar rebate schemes in the EU.

First, regardless the stronger role of Mastercard in the EU with respect to the US, the evidence that *both* Visa and Mastercard are regarded as must-haves by merchants and acquirers suggests that Visa and Mastercard are unlikely to constrain each other on the acquirer side of the market. Both Visa and Mastercard may be able to behave independently of other card schemes in the acquiring side of market.

In addition, Visa and Mastercard are both likely to have a non-contestable portion of the demand: in light of the close-to universal acceptance of their cards by merchants and the evidence from the consumer survey that their cards are either the only or the preferred payment method for a significant portion of consumers, there are likely transactions which would be paid through their payment networks, regardless of the set of payment options available and their display.<sup>241</sup> These transactions may give both Visa and Mastercard the leverage to successfully limit merchants and/or acquirers' incentive to accept cheaper payment methods or to incentivise merchants to divert their transactions towards their network, in exchange for financial benefits based on volume commitments. It should be acknowledged, however, that the share of non-contestable transactions of Visa and Mastercard in the EEA may be lower than that of Visa in the US.

Second, while not directly comparable to debit routing in the US, choice of application for co-badged cards might provide merchants with the direct choice of which network to use, together with the payer. Co-badging of debit cards is very common in the EU member states with a domestic card scheme (see Box 4.3).

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<sup>241</sup> This may be true to a lesser extent in some regions (e.g. the Netherlands and Poland) where A2A payment solutions are close to must-haves.

**Box 4.3: Co-badging of domestic and international card schemes**

Co-badging refers to the combination of different payment card brands on the same card or card-based application. Figure 4.3 shows the percentage of domestic cards issued in France, Germany, Denmark, Italy, Belgium, Portugal and Spain in 2021 that were co-badged with Visa and Mastercard brands, which is often close to 100% and never below 90%.

**Figure 4.3: Infographic on co-badging of national card schemes in the EU**

Source: PayTechLaw.com

Source: Project Team

Co-badging can be a tool to enhance competition between ICS and domestic payment schemes and is also beneficial for cardholders, who can use their cards cross-border. However, to be effective and in line with the Interchange Fee Regulation,<sup>242</sup> both merchants and consumers should not be limited by payment card schemes, issuers, acquirers or other players in the payment value chain in the choice of payment network to be used.

As explained above, conditions in their (or their acquirers') agreements with ICS may influence merchants' decision of which network they accept/prioritise for co-badged cards: for example, agreements of the type described above, including discounts on overall volumes beyond a certain threshold, could have this effect.

Merchants' ability to prioritise ICS in online transactions through co-badged cards depends on whether it is technically feasible for them to influence the choice of payment application in such transactions. A European issuing bank interviewed by the Project Team explained that, in one of the selected countries, for offline transactions merchants may be able to pre-select a network at the POS;<sup>243</sup> and that, although consumers have the right to override this priority selection, in the view of the issuing bank, they are unlikely to do so due to

<sup>242</sup> [https://ec.europa.eu/commission/presscorner/detail/fr/memo\\_16\\_2162](https://ec.europa.eu/commission/presscorner/detail/fr/memo_16_2162).

<sup>243</sup> Whether this is possible depends on the type of POS terminal used.

their inertia, also considering that they would not gain any economic benefit. Therefore, if the merchant has a preference, it may be able to influence the outcome.<sup>244</sup>

Even if such a mechanism is not available in the context of online transactions, to the extent that ICS are able to influence merchants' decision of which network they accept/prioritise for co-badged cards at POS, domestic schemes' scale and, therefore, also their competitiveness in the online space would be limited.

However, there is evidence that domestic schemes face several challenges to expand in the online payment sector which seem largely independent from merchants' choice of payment application.

- some domestic schemes, e.g. Bancomat and Girocard, do not have an online functionality. Therefore, in all the transactions through their co-badged cards the ICS network will automatically be used;
- co-badged cards are associated with two PANs, one for the international and one for the domestic scheme. However, the domestic PAN is typically unknown to consumers, since only the international PAN is reported on the card. In the context of online transactions, co-badged cards are typically identified through their PAN and CVV, which refer to the international scheme.<sup>245</sup> In these cases, therefore, the merchant would not even have a choice of payment application;
- digital wallets could, in principle, allow domestic schemes to overcome the obstacle described in the above bullet point, to the extent that both the international and domestic payment applications are uploaded on the wallet. However, allowing consumers to use both the networks of a co-badged card through pass-through digital wallets such as Apple Pay and Google Pay requires significant additional investments for card issuers, and not all issuers have agreed to sustain such investment.<sup>246</sup> If, however, card issuers did make such investments, allowing the use of the domestic network of a co-badged card through digital wallets, certain practices – if implemented by ICS – may harm domestic schemes: as will be discussed in the next section, ICS may request or incentivize digital wallets to default their payment application.<sup>247</sup>

#### **4.1.2.2. Strategic partnerships with card issuers and digital wallet providers**

ICS have vertical relationships with market participants that use their network as an input: notably, card issuers and digital wallet providers. Given the must-have status of their cards, the input ICS such as Visa and Mastercard provide is crucial for these players: this may

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<sup>244</sup> During the interview, only the offline case was discussed given that the focus of the discussion was the domestic market where the issuing bank is active, where the domestic scheme cannot be used for online transactions.

<sup>245</sup> This information was provided by two domestic schemes involved in the consultation by the Project Team.

<sup>246</sup> More precisely, during an interview with the Project Team, a domestic scheme explained that the card issuer is actively involved in the upload process of cards on this type of wallets by issuing a specific token, requested by the wallet (which acts as token requestor); and that allowing the upload of both payment applications requires the creation of two distinct tokens, thereby duplicating the investment needed. These investments are significant, given that tokens must meet advanced security standards (e.g. cryptographic) and possess innovative functionalities (e.g. the possibility of deactivating a token associated with a specific device). The domestic scheme further explained that, instead, the card issuer is not involved in the upload of cards on staged digital wallets such as PayPal.

<sup>247</sup> A domestic scheme responding to the questionnaire indicated the ICS are able to obtain prioritization of their payment application as the default one, but did not specify the way in which they manage to obtain this advantage.

give them superior bargaining power, which they may leverage to maintain or strengthen their position in the online payment sector.

In particular, publicly available information collected by competition authorities in other jurisdictions has raised concerns that Visa and Mastercard may leverage their must-have status to disincentivise digital wallet providers from:

1. partnering with other card schemes. Alternatively, ICS may request or incentivize digital wallets to favour their networks (e.g. through defaulting) in case of transactions through co-badged cards;
2. developing and/or integrating competing, non-card based products – in the case of wallets that do not offer these functionalities yet (e.g. Apple Pay and Google Pay) – or from encouraging the use of such alternative payment services – in the case of wallets that already do (e.g. Paypal).<sup>248</sup>

Some digital wallets may be particularly attractive partners for ICS:

- the Big Techs' digital wallets are likely to have a competitive advantage in the market segment for wallets, mainly thanks to their access to large user bases: as will be discussed in section 4.3, their advantage in the online payment sector is consequence of their strong market presence and, in some cases, dominance in other IT or digital markets. Partnering with Big Techs may therefore represent an opportunity for ICS to maintain or strengthen their position in the online payment sector, increasing the use the card rails through digital wallets;
- in addition, digital wallets may be in the position to influence the development of payment rails alternative to card schemes: therefore, even the wallets that currently rely on cards only (Apple Pay, Google Pay and Samsung Pay) can be regarded as potential competitors for ICS.

These players may therefore have some countervailing bargaining power and ICS may reward their commercial partners to implement the practices described in point 1. and/or 2. above.

Similarly, card issuers may obtain incentives from card schemes (see Box 4.1): issuers' bargaining power *vis-à-vis* ICS originates from the fact that, differently than acquirers, they do not necessarily need to contract with *both* Visa and Mastercard, as long as they are able to offer consumers at least one of them.

Visa and Mastercard, therefore, compete for issuing banks, together with other card schemes: they may be willing to offer incentives to issuers in exchange for benefits they bring them, for example through exclusive support and/or through commitments to support ICS in their relationship with digital wallets. As will be explained in the next section, indeed, issuing banks are involved in the upload of cards on certain digital wallets.

To a lesser extent than digital wallets, issuers may be also in the position to influence the development of payment rails alternative to card schemes: while issuing banks have developed their own A2A payment methods, they may also be in the position of foreclosing third-party providers of payment methods, as will be further explained in section 4.2.

Below we provide an overview of the functioning of the commercial relationships among ICS, issuing banks and digital wallet providers and of their competitive nature: this will serve as basis for identifying their incentives to partner with one another and for

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<sup>248</sup> The DOJ has alleged that Visa has agreements of this nature with Apple Pay and Paypal in the US.

understanding how such partnerships may be structured. With these premises in mind, we move to discuss the publicly available evidence and information collected through the stakeholder consultation, assessing whether Visa and Mastercard may leverage their vertical relationships with issuing banks and/or digital wallets to reinforce their position in the online payment sector.

#### **4.1.2.2.1. The economic incentives behind partnerships with issuing banks and digital wallets**

Card schemes, card issuers and digital wallets are linked by contractual relationships. Card schemes have contractual relationships with the issuers participating in their networks and issuing their cards. All digital wallets need agreements with card schemes to allow consumers to upload their cards. Some digital wallets – notably, pass-through wallets (e.g. Apple Pay and Google Pay) – need further agreements with the issuers of the cards.<sup>249</sup> Staged digital wallets such as Paypal and Amazon Pay, instead, do not need a contractual relationship with issuers to allow their cards to be uploaded by consumers on the wallet.

In particular, the card issuer is actively involved in the upload process of cards on pass-through wallets by issuing a specific token, requested by the wallet (which acts as token requestor).

Publicly available information confirms the above description: information available on [Apple](#), [Google](#) and [Samsung](#) websites shows that which cards are supported depends on the issuing bank; Bancomat, the Italian domestic card scheme, has recently [announced](#) that its PagoBANCOMAT cards issued by Intesa Sanpaolo can now be uploaded in Apple Pay. [Paypal](#) and [Amazon](#), instead, only lists the card schemes that they accept.

A crucial preliminary step to assessing their economic incentives to partner with one another is understanding the monetization strategies of the players involved in online transactions through payment cards – and whether and how the picture changes when digital wallets are used. The flow of fees described in Box 4.1 above applies to all card transactions, both through physical cards and through digital wallets. The sources of revenues for card schemes are, therefore, unchanged if consumers use their cards through digital wallets to make online payments.

The monetization model of digital wallets may vary based on the type of wallet (pass-through v. staged) and also across individual wallets.

Apple Pay is remunerated by issuing banks, which pay Apple Pay a fee for each transaction, as explained by stakeholders interviewed by the Project Team and confirmed by publicly available information.<sup>250</sup> Such fees seem to be significant: in an antitrust lawsuit filed by the DOJ in March 2024 against Apple for alleged monopolisation in the smartphones market,<sup>251</sup> the DOJ alleges that the fees imposed on banks for credit card transactions facilitated through Apple Pay represent “a significant new cost”. According to the DOJ, Apple charges issuing banks a fee of 0.15 percent per credit card transaction processed via

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<sup>249</sup> The stakeholder consultation – in particular, the card scheme and provider of payment applications questionnaires and an interview with an European issuing bank – has confirmed this understanding. In particular, 3 out of the 4 card schemes responding to our questionnaire, indicated they have to reach an agreement with the digital wallet provider before the card-based payment applications under their brand can be uploaded on the digital wallet. Most of the respondents also indicated that it is also the issuing bank’s decision. In addition, a major digital wallet provider confirmed it has contractual relationships with card schemes.

<sup>250</sup> <https://www.checkout.com/blog/apple-pay-for-business>.

<sup>251</sup> DOJ. 21 March 2024. Case 2:24-cv-04055.

Apple Pay. Just as a reference, the interchange fee that issuing banks collect from Visa and Mastercard intra-EEA transactions through consumer credit card is 0.30 percent: although in the US interchange fees are higher than in the EEA, the evidence from the DOJ suggests that issuing banks may be paying a significant proportion of the interchange fees they collect to Apple Pay.<sup>252</sup>

Three out of five digital wallet providers responding to our questionnaire confirmed they charge issuing banks.<sup>253</sup> Google Pay, instead, does not charge any fee yet.<sup>254</sup>

The monetisation model of staged digital wallets is different: Paypal, for example, charges merchants (see Table 1.24) as two staged digital wallet providers that replied to this question.<sup>255</sup> As indicated in Table 1.24, pass-through wallets do not apply additional fees to merchants.

In assessing the incentives of card schemes to partner with Big Techs, it should be considered that their relationships are not purely vertical.

The contributions of the two ICS which participated in our consultation highlighted the wide variety of categories of market players that they regard as competitors, including digital wallets. In particular, they reported they:

- “no longer perceive other payment card schemes as our main competitors as the market is much broader”;
- “[face] competition from local and regional networks, alternative payment providers, real-time payment networks, digital wallet providers, and payment processors, among others”, also noting that “one player may be a competitor [...] in one field but could offer a complementary product or service in another field”.

While these claims should be taken with caution, the relationship between card schemes and digital wallets does have both a vertical and horizontal dimension and, at least potentially, digital wallets can represent a competitive threat for card schemes, either actual or potential.

Some digital wallets (e.g. Paypal, Amazon Pay, Meta Pay) already support payment services alternative to card schemes. Therefore, they both contribute to ICS business volumes and compete with them.

Two card schemes responding to our questionnaire included Paypal among their closest competitors, suggesting competition between card schemes and digital wallets. Although this may be driven by the fact that these players offer their own wallet, the decision to

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<sup>252</sup> The DOJ complaint against Apple further reveals that Apple projects its worldwide revenue from Apple Pay fees will approach \$1 billion by 2025. Based on this information, Australian payment experts conducted an analysis, combining data from a U.S. class-action lawsuit with recent figures released by the Reserve Bank of Australia (RBA) on digital wallet usage, as reported in the RBA Payment System Board’s annual report. The findings estimate that Australian banks collectively pay Apple approximately \$112 million annually in fees. Of this amount, \$22 million is attributed to debit card transactions, while \$90 million arises from credit card transactions (Apple Pay costs for Australian banks revealed. Financial review. 13 December 2022. <https://www.afr.com/companies/financial-services/apple-pay-costs-for-australian-banks-revealed-20221209-p5c527>).

<sup>253</sup> The respondents also specified that their remuneration is independent from the interchange fee.

<sup>254</sup> This information was provided by an association of domestic banks.

<sup>255</sup> One of the two reported it also charges issuers.

“enter” the digital wallet market segment through their own solution can also be considered an indication that card schemes perceive the competitive threat of digital wallets.

Digital wallets that currently only support cards may either integrate alternative, non-card-based payment solutions in their wallet or develop their own: this would deprive ICS of business volumes. In a discussion paper from 2022, the UK Financial Conduct Authority (“FCA”) noted that Big Techs could facilitate the adoption of payments through a non-card payment rail, such as Faster Payments.<sup>256</sup>

As noted in section 3.3.2 above, wallets currently contribute significantly to ICS business volumes: it can be estimated that 27.6% of ICS transactions are processed through digital wallets. This also suggests that, should the main wallets start supporting alternative payment services, a portion of these transactions would shift towards alternative payment services, leading to potentially significant losses for ICS.

The evidence collected from the stakeholder consultation also suggests that the competitive threat of A2A payment solutions based on alternative payment services may be concrete for card schemes: two card schemes<sup>257</sup> responding to the questionnaire reported they perceive A2A as close competitors; additionally a written contribution provided by another ICS also highlighted that they perceive the competitive pressure of A2A solution, further noting that they are expected to grow. In particular, the two ICS that participated in the consultation as well as the other card schemes which have completed the questionnaire, all believe that EPI is likely to grow in the foreseeable future.

The evidence collected by the DOJ in the context of investigations against Visa, which will be discussed in the next section, confirms that Visa perceives payment methods relying on alternative payment rails as a competitive threat.

Therefore, while in the short-term collaborating with Big Techs contribute to increasing ICS’ business volumes, in a longer term, if wallets start incorporating other payment services, this could be a cost for ICS related to partnerships with Big Techs: they could have favoured entry of players that would by then be in the position to take business volumes away from them.

The above analysis suggests that ICS, digital wallets and banks can bring benefits to one another in the following ways:

- Card schemes may increase their business volumes by collaborating with Big Techs, both in the short-term and in a longer term.
  - Digital wallets may indeed allow card schemes to capture volumes of transactions that would otherwise be made through alternative payment rails;
  - ICS may want to provide incentives to specific digital wallets with a large user base to discourage them from developing competing payment solutions that could disintermediate card schemes;
  - It should be noted that the fees that some digital wallets apply to issuing banks may represent a hidden cost of partnerships with Big Techs for ICS, since they erode the incentives that ICS grant issuing banks. However, ICS may provide additional incentives thanks to the growth in their volumes of

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<sup>256</sup> Potential integration of cryptoassets within the Big Techs’ digital wallets is also mentioned by the FCA, but this is out of the scope of this study.

<sup>257</sup> One domestic scheme and one ICS.

transactions. In any case, it seems unlikely that ICS could lose customer banks for this reason: if issuing banks expect both Visa and Mastercard to be partnering with Big Techs, they do not have a viable alternative; indeed, issuing banks accept to partner with Big Techs, favouring the upload of the cards they issue on their wallets;

- Big Techs need the cards under the major brands to be compatible with their wallets to obtain a relevant presence in the online payment sector. Reaching relevant scale in the online payment sector, in turn, allows them to enrich their ecosystem of services (see section 4.3);
- The incentives of issuing banks are perhaps less obvious: while they may also be able to capture additional business volumes as digital wallets become more widely used, the involvement of digital wallets seems to imply significant additional costs for them. However, banks are increasingly investing in digital products to address evolving consumer demand, offering more choice and better user experience.<sup>258</sup> Overall, the additional business volumes may outweigh the costs for banks, at least in the longer term.<sup>259</sup>

The DOJ allegations suggest that, if ICS are willing to provide digital wallets with financial incentives not to incorporate or develop competing payment solutions, they may leverage the following tools:

- the scheme fee: ICS could provide rebates on scheme fees in order to encourage acceptance by merchants. In this scenario, the card scheme would be accepting a reduction in its revenues, and it would do so in exchange of expected increased volumes.<sup>260</sup> Alternatively, they could threaten digital wallets to apply high, punitive scheme fees to their transactions;
- if there is any wallet fee that the card scheme charges to the digital wallet, card schemes could leverage this fee to disincentivise the wallet from – granting rebates or threatening to increase such fees. The stakeholder consultation is not conclusive on the existence of such fees.<sup>261</sup> The DOJ, in its investigation against Visa, has found that Visa charges “wallet fees” to Paypal (see next section);
- if the above tools are not available, ICS may still provide incentive payments to Big Techs’ wallets, in exchange for their commitment not to develop competing products.

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<sup>258</sup> The European issuing bank interviewed by the Project Team explained that they are adapting their offer to evolving consumer preferences and they want to offer their customers as many payment methods as possible.

<sup>259</sup> One advantage of Big Techs *vis-à-vis* issuing banks with respect to other wallets may be that they may provide supporting services to issuing banks for SCA and have outsourcing agreements with them for this purpose, as noted by two associations during interviews with the Project Team. In particular, Big Techs – and, in particular, Apple Pay and Google Pay – may leverage their technology for biometric authentication to comply with SCA. However, a domestic bank association interviewed by the Project Team denied that the involvement of Big Techs made compliance with SCA any easier.

<sup>260</sup> As will be explained in the next section, the stakeholder consultation did not provide conclusive evidence on whether ICS apply rebates on scheme fees for this purpose.

<sup>261</sup> None of the three domestic schemes responding to the question asking whether they charge wallet providers a transaction fee reported they do. However, the two ICS did not reply to this question.

#### 4.1.2.2.2. The available evidence on strategic partnerships

The stakeholder consultation provided some indication that ICS may be able to influence wallets' and possibly issuing banks' decision on which card brands to support and, in particular, that they may be able to harm domestic schemes:

- A staged digital wallet provider widely used in various EU countries reported that conditions agreed with card schemes – and, in particular, Visa and Mastercard – and technical complexities behind the integration of certain card brands affect their decision not to support certain card brands. The other responses provided by the operator may suggest that these conditions could negatively affect domestic schemes: indeed, it reported that the only cards which can be used through its wallet<sup>262</sup> are ICS and, in particular, Visa and Mastercard credit and debit cards (including VPay and Maestro), American Express and Diners credit cards.<sup>263</sup> However, when asked to indicate which cards were affected by technical complexities that prevented their integration in the wallet, the provider indicated Visa and Mastercard (both credit and debit) cards. This raises questions on the reliability of its responses, since this response seems inconsistent with the evidence that the provider does support Visa and Mastercard cards;<sup>264</sup>
- The same issue was raised by another anonymous digital wallet provider which only supports Visa and Mastercard credit and debit cards;
- One anonymous digital wallet reported that their choice of which card brands to support is affected by issuing banks' requirements, which in turn are the result of banks' agreements with ICS. In particular, they claim they are requested by banks to support certain brands, typically Mastercard and Visa, despite their preference would be to support cheaper local schemes. It is unclear, however, whether the respondent is suggesting that it is limited in the number of local schemes they can support<sup>265</sup> or whether they would not accept (some of the) Visa and Mastercard if they were not requested to do so;<sup>266</sup>
- A domestic card scheme reported that there are restrictions from wallet providers on the payment applications to be uploaded.

Taken all together, the above information provided by stakeholder could suggest that ICS may indeed be able to disincentivize digital wallets to accept other card schemes – or to incentivise them to accept all of their cards; and that issuing banks that have agreements with ICS may contribute to this strategy.

The stakeholder consultation did not provide any indication that ICS apply differentiated conditions to Big Techs and other digital wallet providers – through differentiated scheme or wallet fees. However, this should not be considered conclusive evidence that ICS do not implement such strategies, given the limited number of responses, the fact that the ICS

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<sup>262</sup> In addition to non-card-based payment services (direct debit) and e-money.

<sup>263</sup> Another factor that the provider mentioned among the drivers behind their choice of which cards to support was ubiquity.

<sup>264</sup> The provider did not respond to a request for clarification on this issue by the Project Team.

<sup>265</sup> The respondent supports the following domestic schemes: Bancomat (Italy), Bancontact (Belgium), Cartes Bancaires (France) and Dankort (Denmark).

<sup>266</sup> More precisely, the respondent claims that: "Our clients (banks) requests to support certain brands, typically Mastercard and Visa. We would prefer to accept local schemes instead, which are cheaper, but due to the agreements reached between banks and International Card Schemes we have no choice but to accept them."

participating in the consultation did not reply to the questions that were meant to elicit such information, and the sensitive nature of the information requested.<sup>267</sup>

Evidence collected by competition and regulatory authorities in other jurisdictions (the US and the UK) suggest that ICS fear potential disruptors and may be willing to partner with them to disincentivise from developing competing products or encouraging the use of such products.

The DOJ has disclosed strategic partnerships agreements between Visa and digital wallets in the US – Apple Pay and Paypal, in particular – whereby digital wallet providers are rewarded with financial benefits for their commitment not to develop payment solutions competing with Visa or not to encourage use of such solutions. According to the DOJ allegation, Visa also threatens digital wallets with the imposition of additional fees in case they develop competing products.<sup>268</sup>

The DOJ analysis of Visa's internal documents reveals that these partnerships were meant to eliminate a potential competitive threat: *"Visa's strategy has been to 'partner with emerging players before they become disruptors'"* (DOJ complaint, paragraph 16).

According to the DOJ, Visa is concerned by the actual or potential competitive threat represented by Apple Pay and Paypal, since these players have relationships with both accountholders and merchants, and fears that *"these digital platforms may have 'network ambitions'"* (DOJ complaint, paragraph 15), because they could be positioned to build the scale necessary to succeed as a payment platform.<sup>269</sup> The DOJ has identified exclusionary agreements with both Apple Pay and Paypal. In particular:

- Visa rewards Apple Pay through targeted payments – which, according to the DOJ, amounted to hundreds of millions of dollars in 2023 – and also through reduced "merchant fees" to encourage merchants' acceptance of Apple Pay, as described in the previous section.<sup>270</sup> In exchange of these benefits, Visa obtains an express commitment from Apple not to develop competing payment products, thereby eliminating a potential competitive constraint for Visa.<sup>271</sup> Visa's internal documents examined by the DOJ revealed that "Visa saw Apple Pay [...] as an "existential threat" to its debit business";
- Paypal is a staged digital wallet and also supports payment services alternative to cards, allowing users to pay directly through their bank accounts, thereby

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<sup>267</sup> Questions were included in the questionnaire for card schemes aimed at investigating whether card schemes apply heterogeneous conditions (scheme fees, interchange fees, wallet fees (if any) or any other transaction fee) across digital wallets and, if so, at assessing the differences among individual digital wallets.

<sup>268</sup> In particular, according to the DOJ, *"Visa offers lucrative incentives, sometimes worth hundreds of millions of dollars annually, to these potential competitors under the express condition that they do not develop a competing product or compete in ways that could threaten Visa's dominance. In addition to the carrot of these incentives, Visa has also threatened to use the stick of additional fees to dissuade their potential competitors' innovation—if they develop competing products"* (DOJ complaint, paragraph 16).

<sup>269</sup> Visa allegedly acknowledged that when two-sided transaction platforms *"achieve scale on the two sides, it's an enormous moat around their business, and far more powerful than a one-sided but still network effect businesses"*.

<sup>270</sup> "Visa has also provided Apple with reduced merchant fees in exchange for Apple's commitment not to 'build, support, or introduce payment technologies that disintermediate Visa' or steer customers to third party payment methods such as ACH" (DOJ complaint, paragraph 136). In the DOJ complaint, ACH refers to automated clearing house, a payment method relying on bank transfers.

<sup>271</sup> The DOJ alleges they first entered into an agreement in 2012.

representing an actual competitive threat for Visa. According to the DOJ, Paypal was seen by Visa as an “increased disintermediation risk for issuers and Visa”, since it was encouraging its users to pay through their bank accounts. For this reason, Visa and Paypal allegedly entered into agreement whereby Visa threatens high wallet fees and rack rates on Visa transactions through Paypal to obtain Paypal’s commitment not to compete aggressively.<sup>272</sup>

Evidence of specific conditions within agreements between ICS and their partners such as that collected by the DOJ is difficult to obtain without investigative powers.

In the absence of this type of hard evidence, we factually observe that Apple Pay, Google Pay and Samsung Pay only support cards.

Publicly available information also suggests that ICS actually helped Big Techs penetrate the online payments market. For instance, there is evidence that Apple has collaborated with the main card networks (i.e. Visa, MasterCard and American Express) and banks for the development of Apple Pay, starting from 2013 in the US.<sup>273</sup> In particular, the know-how and infrastructure of established players such as card schemes and banks were needed to develop the technology used for tokenisation of payment cards, which is necessary for the upload of card-based applications in mobile wallets. As will be further discussed in section 4.3, this collaboration has been crucial to facilitate Apple Pay’s entry into the payment markets and has likely benefitted other Big Techs as well.

At that time, Mastercard’s vice president reportedly said that “[t]here are schemes that don’t respect and honor the payment networks”, and that Mastercard “want[s] to invest in programs that respect our role in the ecosystem”.<sup>274</sup>

In light of the recent evidence disclosed by the DOJ, this may raise the question whether the Big Techs’ decisions not to support alternative payment rails reflects strategical considerations and whether ICS played a role in these decisions.

One important aspect in the allegations made by the DOJ is that, absent the agreements with Visa, Paypal would have encouraged consumers to pay through payment services alternative to cards. Paypal would have an incentive to do so because such payment services result in higher profits for Paypal. This is not a specificity of the US online payment sector: also in the EEA, Paypal pays scheme fees for card-based transactions, while transactions through alternative payment services result in lower fees.

In its ongoing market review, the PSR also finds that in the UK “Paypal has entered into agreements with Mastercard and Visa not to steer customers away from those schemes’ cards”.<sup>275</sup>

Further evidence of Visa’s and Mastercard’s market conduct in the US and, to a lesser extent, in the EEA suggest that they fear competition from fintech payment solutions and

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<sup>272</sup> Visa and Paypal allegedly first entered into such an agreement in 2016 and into a new 10-year agreement in 2022.

<sup>273</sup> Banks Did It Apple's Way in Payments by Mobile - The New York Times (nytimes.com). This article reports that Apple has started conversations with the largest credit card in January 2013 to initiate a project that would have led to the launch of Apple Pay, and banks were also involved in this project.

<sup>274</sup> *Ibidem*.

<sup>275</sup> Interim report of the PSR market review of scheme and processing fees, paragraph 4.119.

may implement practices aimed at preventing them from becoming disruptors, including through targeted acquisitions.

In 2020, Visa announced its planned acquisition of the US fintech Plaid. At that time, Plaid was a financial data aggregator allowing consumers to provide their banking information to trading and investing applications like Acorns, Betterment, and Robinhood. The DOJ challenged the acquisition as potentially anticompetitive,<sup>276</sup> for its intent to eliminate a competitor. According to the DOJ, Plaid could leverage its technology and established connections with banks to launch an A2A payment method competing with Visa at a lower cost to merchants. Also in this case, the DOJ found claims by Visa that unveil a possible exclusionary intent of this conduct: according to the DOJ, Visa's CEO viewed the acquisition of Plaid as an "insurance policy" to neutralize a "threat to [Visa's] important US debit business" and justified the extraordinary price of the deal of \$5.3 billion – the second largest in Visa's history – to Visa's Board of Directors as a "strategic, not financial" move noting the importance of the US debit business for Visa, which "must always do what it takes to protect this business".

The acquisition by Visa of the Swedish PIS Tink, completed in 2022, can be interpreted as a further indication that Visa perceives non-card-based payment solutions as a competitive threat: Tink is one of the largest PIS based on open banking in the EEA. Some commentators raised concerns that the transaction could face antitrust concerns similar to the failed Plaid deal in the US.<sup>277</sup> The competitive pressure that Tink exerted on Visa is, however, fairly limited: as shown in section 3.3 the position of third-party PIS operators across the EEA is negligible. The acquisition may have been adopted by Visa as a strategy aimed at ensuring that also Visa could benefit from a potential growth in the open banking sector. Similarly, in 2020 Mastercard acquired the US fintech Finicity to strengthen its open banking position. It should also be considered, in addition, that such fintech operators may grow under the ICS umbrella and as a result of the acquisitions.

Finally, in 2020 Mastercard became one of the seven shareholders of Polski Standard Płatności, which operates the Polish A2A payment application Blik: Poland is one of the few European countries where A2A solutions are more used than cards and this outcome is attributable to the popularity of Blik.<sup>278</sup>

To sum up, the evidence discussed above may suggest that:

- ICS may be able to leverage their relationships with card issuers and digital wallets to harm domestic card schemes, in particular limiting their use through digital wallets. This could further widen the gap between ICS and other card schemes, in particular domestic ones;
- ICS perceive alternative, non-card based payment rails as a competitive threat. Although the prospect that such alternative payment rails actually displace Visa and Mastercard across the EEA does not seem plausible in the near future, ICS may have taken preventive measures aimed at maintaining their key position in the online payment sector. In particular:

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<sup>276</sup> In particular, the DOJ alleged that the acquisition announced by Visa could constitute a violation of both Section 7 of the Clayton Act and Section 2 of the Sherman Act.

<sup>277</sup> <https://www.reuters.com/business/visa-buy-european-open-banking-platform-tink-215-billion-2021-06-24/>.

<sup>278</sup> More precisely, Blik is now a venture of six Polish banks and Mastercard, and they all own an equal amount of its shares.

- they may have the ability and incentives to secure strategic agreements with market players (notably, digital wallet providers) who would be positioned to favour the expansion of such alternative payment networks, thanks to established acceptance networks and user bases. These agreements could have the effect of precluding payment methods based on alternative payment rails to gain scale;
- at the same time, they have adopted moves that ensure they will still be relevant in the online payment markets in the scenario in which such alternative, non-card based payment rails manage to prevail in any case, in particular relying on targeted acquisitions.

#### **4.1.2.2.3. Effects of partnerships on competition in online payments**

Partnerships between ICS and Big Techs have likely been beneficial for consumers, allowing cardholders to use innovative and convenient payment solutions. However, they also have the potential to stifle competition in the long term, favouring entrenchment of both ICS and Big Techs. There are several ways in which these partnerships may have a detrimental effect on competition in online payments:

- they can further widen the gap between ICS and other card schemes, in particular domestic ones;
- they can deprive the market of innovative and potentially cheaper payment methods, based on payment services alternative to cards. In particular, i) they could deprive actual or potential providers of such payment methods of the necessary scale to compete effectively and ii) they could disincentivize the established market players partnering with ICS from developing their own;
- they may allow some of the Big Techs to capture a larger and larger share of digital wallet transactions, making this market segment tip in their favour and their position hard to challenge for newcomers in the future.

Ultimately, all of the above can result in harm for merchants and consumers, in the form of additional costs or reduced choice and/or innovation.

## 4.2. The role of banks in online payments

### Key take-aways

- Issuing banks are established players in the payment industry and are involved in online transactions through all payment services;
- In several MS, banks have jointly promoted their own A2A payment application, with notable examples including Blik, iDEAL and Swish. Most of these bank-supported payment solutions have been national or regional. Recently, however, the banks that are behind some of the above payment solutions have partnered to develop cross-border initiatives (the EPI and EuroPA Project);
- These initiatives may contribute to the emergence of market players that could challenge established global players, including ICS as well as Paypal and Apple Pay;
- Partnerships among banks may lead to greater consolidation, amplifying the financial strength and market influence of banks, potentially favouring larger players at the expense of diversity and innovation;
- The stakeholder consultation has raised concerns that banks may have implemented practices to the detriment of third-party providers that rely on banks' inputs for the provision of their payment methods.

Similarly to card schemes, issuing banks have a pervasive role in the online payments industry and can be considered incumbent players.

Banks play a key role in most transactions, albeit in varying capacities. In particular:

- they facilitate credit transfers and direct debits, enabling the transfer of funds from the payer's account to the payee's account;
- they are involved in card-based payments, as they are the financial institutions that issue payment cards. For each card-based transaction, including through digital wallets, issuing banks receive the interchange fee (see Box 4.1);
- by enabling transfers or direct debits, they also play a role in A2A payment applications, including online banking and open banking<sup>279</sup> and, in some cases, also wallets.

Banks across the EEA offer their proprietary solutions for A2A payment applications and digital wallets. Such solutions were often developed through the joint effort of multiple banks. To make a few examples:

- in the Netherlands, banks own the most popular A2A payment application (i.e. iDEAL). Having been released in 2005, iDEAL is one of the oldest European A2A payment methods;
- as mentioned in section 4.1.2.2 the Polish A2A payment solution Blik is owned by six Polish banks and Mastercard and it was launched in 2015;
- Swish was launched in 2012 by six large Swedish banks, in collaboration with Bankgirot, the Swedish card scheme;
- Bizum is an initiative of some of the major Spanish banks, founded in 2016;

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<sup>279</sup> The concept of open banking will be introduced in chapter III, when discussing PSD2.

- in Italy and in Portugal, domestic card schemes, which are banks' commercial partners, have developed their A2A payment solution (SIBS and Bancomat Pay, offered by Scheme MB and Bancomat respectively);
- Payconiq, launched in 2015 and originally active in Luxemburg and Belgium,<sup>280</sup> had the initial support of ING Bank, which was joined later by two Belgian banks. In 2018, its Belgian subsidiary (Payconiq Belgium) was acquired by Bancontact, the major Belgian payment application, originally established by the Belgian card scheme in 1989 and supported by the major Belgian banks;
- Scandinavian countries also witnessed some integration of banks with digital wallets: the Danish bank Danske Bank and the Norwegian bank BNB launched the digital wallets Mobile Pay and Vipps, respectively in 2013 and 2015. The two wallets have merged in 2022, under the ownership of Danske Bank and a consortium of Norwegian banks. The merger has been investigated and cleared by the European Commission.<sup>281</sup>

Until recently, bank-supported payment solutions were mostly national or regional: also Mobile Pay/Vipps, which is not national, is mostly used within the Nordic region. As explained earlier in this chapter, one of the reasons why these solutions remain confined to their national or regional boundaries is that they need the technical and commercial support of banks. Recently, the banks that are behind some of the above payment solutions have partnered to develop cross-border initiatives:

- A group of 16 major Eurozone banks from Belgium, France, Germany and the Netherlands<sup>282</sup> founded EPI in 2020. In September 2024, EPI acquired iDEAL and Payconiq International, making an important step forward in the ambitious plan to develop a Pan-European A2A payment solution. Following the acquisition, EPI launched Wero, a new A2A digital wallet based on instant payments: it currently supports only (cross-border) peer-to-peer payments, but it plans to integrate e-commerce functionalities, potentially including BNPL options, as claimed by the company.<sup>283</sup> Recent news report that a group of German banks is preparing to end their support of Paydirekt – a German payment method that merged with GiroPay and Kwitt – to support EPI.<sup>284</sup> Wero is currently operational in 5 MS (Belgium, France, Germany, Luxemburg and the Netherlands), but is designed to expand geographically.
- In November 2024,<sup>285</sup> Bancomat Pay, Bizum, and MB WAY launched the EuroPA Project, which enables interoperability among the three domestic A2A payment solutions for P2P transactions through instant payments. As a result, the three applications, while maintaining separate brands and interfaces, will be able to communicate with one another. Evidence collected through the stakeholder

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<sup>280</sup> Payconiq International has recently been acquired by EPI and Payconiq Belgium has been acquired by Bancontact in 2018.

<sup>281</sup> <https://competition-cases.ec.europa.eu/cases/M.10935>.

<sup>282</sup> More precisely, fourteen banks and two acquirers: ABN Amro, Belfius, Crédit Mutuel, BNP Paribas, Groupe BPCE, Crédit Agricole, Deutsche Bank, Sparkassen-Finanzgruppe, DZ Bank, ING Group, KBC Bank, La Banque Postale, Nexi, Rabobank, Société Générale, Worldline.

<sup>283</sup> <https://epicompany.eu>.

<sup>284</sup> <https://www.fintechfutures.com/2024/06/germanys-paydirekt-reportedly-heading-for-closure-in-favour-of-epi/>.

<sup>285</sup> The parties originally signed an agreement in December 2023 outlining the interoperability criteria.

consultation indicates that the members are interested in extending the project to e-commerce and are currently developing a work plan for this purpose with their partners.

These market developments raise important questions for the competitive dynamics being assessed in this study. The pooling of resources and strategic partnerships may lead to greater consolidation, amplifying the financial strength and market influence of banks. By reinforcing each other, these dynamics could reshape the competitive landscape, potentially favouring larger players at the expense of diversity and innovation.

Partnerships among banks could also be considered as potential contributors to the emergence of market players that could challenge established global players. As discussed in section 4.1.2.2, A2A payment methods currently represent a potential competitive threat for card-based applications and card schemes, but they are mostly limited to their national boundaries. The joined efforts of banks to foster EPI and the EuroPA Project may contribute to the rise of a Pan-European payment solution that may become a more credible competitor for ICS.

In addition, such initiatives among banks may allow them to take shares of demand away from players such as Paypal and Apple Pay which, as will be discussed in section 4.3, are the most relevant players in the digital wallets' segment and are particularly well-positioned to take advantage of emerging trends and develop new payment methods.

In the Mobile Pay/Vipps proceeding, market participants – when surveyed about the potential effects of the transaction – noted that it would have represented “[b]etter change for a solution that covers all the Nordics and is able to compete with global players”, and that “[a]s regards the competitive landscape, a merged entity could increase pressure on highly established and market-strong competitors in the Nordics, such as Paypal and Klarna, having positive effects on pricing, overall conditions and innovation in the market. For e-commerce platforms offering such payment services to end customers, a consolidation of service providers across countries could simplify the technical implementation, onboarding processes, contractual negotiations etc”. These considerations contributed to the Commission’s conclusion that the impact of the merger on the market for (mobile) payment services would have likely been positive or neutral.

Consolidation among banks could, however, create opportunities for coordinated practices that may effectively foreclose competing payment solutions. The antitrust characterization of the banks’ partnerships may be twofold.

First, they may be considered under Article 101 of the TFEU: if partnerships included any explicit agreement or other forms of mutual understanding to collectively adopt market conducts aimed at foreclosing independent rivals, this behaviour would be caught by the prohibition. Another reason why banks may have aligned incentives to hinder the expansion of third-party PISPs is that this could benefit card-based payment methods; and the evidence suggests that the profits they collect for these transactions<sup>286</sup> are higher than their remuneration for A2A solution (see Table 1.24).<sup>287</sup>

Parallel conducts that may restrict or distort competition could fall under the scope of Article 101 of the TFEU, to the extent that there is an implicit understanding or awareness of such conduct.

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<sup>286</sup> Equal to the interchange fees net of any fee they pay to card schemes (see Box 4.1).

<sup>287</sup> This was also reported by two associations interviewed by the Project Team.

Second, in the (unlikely) case in which banks collectively hold a dominant position, their coordinated foreclosing conduct may amount to an abuse of collective dominance under Article 102 of the TFEU.<sup>288</sup> However, the jurisprudence suggests that to ascertain collective dominance, mechanisms should be available to monitor whether competitors are adopting the common policy and implement a punishment strategy in case of deviations.<sup>289</sup> Satisfying all the necessary conditions for the application of the notion of collective dominance seems unlikely in the case of partnerships among banks.

The stakeholders participating in our consultation shared the concern that third-party PISPs across the EEA may be harmed by banks' conducts, as they appear to implement PSD2 regulation in a manner that hinders the expansion of third-party PISPs.

First, they may offer poor-quality PSD2 dedicated interfaces. Under PSD2, banks are obliged to allow access to their customers' financial data to other banks and other authorised institutions, including independent third-party providers such as Payment Initiation Service Providers (PISPs), provided that the customer has given consent (see Box 3.2). This is technically achieved through the use of Application Programming Interfaces (APIs), which allow for cross-platform collaboration. The PSD2 RTS gave banks the possibility to allow access to customers' account data to PISPs under the scope of PSD2 through a dedicated interface. Despite the requirements envisaged by PSD2 RTS which prescribe that "account servicing payment service providers that have put in place a dedicated interface shall ensure that the dedicated interface offers at all times the same level of availability and performance, including support, as the interfaces made available to the payment service user for directly accessing its payment account online" (art. 32), some stakeholders raised the concern that banks have been offering poor quality APIs to PISPs to access the dedicated interface. This is based on information collected from:

- an association of third-party providers interviewed by the Project Team. In particular, the association noted that, as a result of poor-quality APIs, the authentication process can be lengthy, complex and burdensome for consumers, who have to undertake several steps across disjointed platforms (the merchant's, PISP's and bank's), contributing to high drop-off/abandonment rates and major losses for PISPs;
- a third-party provider response to the Project Team's questionnaire. In particular, the provider indicated among the main obstacles to expand *"ASPSPs PSD2 dedicated interfaces not working as they should, e.g. extra steps in the journey and allowing payers to cancel a payment after initiation"*.

The association also explained that in some MS, especially in Southern Europe, all banks rely on the same API provider; and sometimes the development of the API is outsourced to an external provider (e.g. CBI Globe in Italy). This can explain that banks within these countries provide APIs of similar quality – even in the absence of coordinated or concerted behaviour. It is unclear, however, why banks prefer relying on external API providers if, according to the association, they would have the in-house technology to develop their own. One reason may be that this solution is more cost-effective.

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<sup>288</sup> Abuses of collective dominance are rare in the Commission's and national competition authorities' case law. The concept of collective dominance has, in some cases, been applied by competition authorities in the context of merger control, and in particular of the assessment of potential coordinated effects of the transaction under scrutiny. The Airtours merger (2002) is a landmark case for the application of the notion of collective dominance; other cases in which this notion was applied include the Impala II case (2008) and AEM/ASM Brescia (2007).

<sup>289</sup> See the General Court's judgment on the Airtours case (paragraph 62).

Second, banks may limit the number of initiated payments that are executed. The third-party provider mentioned above noted that ASPSPs do not ensure PIS instant settlement or do not execute a high share of initiated payments, *"leading to merchants not having the certainty they need that a PIS journey will end up in a completed (settled) payment"*.

The association of TPPs further explained that banks often set limits on the number of API calls per second that a TPP is allowed to make to the bank. These limits are allegedly set for security concerns and over the set limit the payer can get a denial so the payment cannot be completed.<sup>290</sup>

They may charge payers for making credit transfers: this would discourage consumers from choosing certain payment methods over similar alternatives that do not entail this additional cost. The third-party provider highlighted that *"ASPSPs charging payers for making credit transfers"* is among the obstacles they face to expand, combined with the fact that credit transfers through their payment application<sup>291</sup> are free of charge.<sup>292</sup>

All the above results in additional costs for consumers (either monetary or in terms of time and convenience), discouraging them from using these payment methods, which would in turn affect merchants' willingness to accept them.

The information provided by the stakeholders which participated in the consultation also suggests that this behaviour may be driven, *inter alia*, by the fact that banks want to support their proprietary payment solutions:

- the third-party provider association argued that many banks have the ability to provide better quality APIs than those offered to third-party PISPs, as they have proven to do so for their own mobile apps. They also noted that third-party PISPs have found it particularly difficult to penetrate the Dutch market, characterized by the strong presence of the bank-owned A2A solution iDEAL. They further specified that the success of iDEAL is attributable, *inter alia*, to the low prices it charges acquirers, which are hard to match for a newcomer. The association reported these prices are expected to increase following the acquisition of iDEAL by EPI;
- the third-party provider which joined the consultation noted that ASPSPs offer their proprietary credit-transfer based payment solutions (e.g. Swish in Sweden, Bizum in Spain) for which they allow for a better customer experience, by offering: a) an easy user journey with better authentication methods than available in the online bank (and thus for PIS), b) payment guarantee - every initiated payment will be executed by the ASPSP, c) no charge on payers for making the payment.

The above evidence suggests that the dedicated interfaces offered by banks may be capable of discriminating against third-party providers and may therefore not comply with the obligations envisaged by art. 32 of the PSD2 RTS.

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<sup>290</sup> According to the association, the fact that these limits apply to third-party providers for all their users (rather than being set per user) can pose significant challenges for third-party providers' activity.

<sup>291</sup> It mentions, as examples, Swish in Sweden and Bizum in Spain.

<sup>292</sup> The [Impact Assessment of the Instant Payment Regulation](#) published by the European Commission provides some indication on whether banks charge higher transaction fees for instant payments than for regular credit transfers. It documents that in Spain and France instant payments are free of charge only when initiated via Bizum and Paylib, respectively. In several MS analysed (Estonia, Lithuania, Latvia, Finland and the Netherlands) the findings show that all PSPs charge the same fees for regular credit transfers and instant payments. The report also provides evidence of a strong negative correlation between the cost of instant payments and the level of uptake.

The information provided by the above stakeholders also suggests that there may be differences in the extent to which banks' interfaces comply with the PSD2 RTS, also in light of differences in the implementation of regulation. Both the provider and the association noted that there are differences in the implementation of regulatory standards across Member States; the provider also observes that these divergences, together with differences in supervision practices, have raised barriers preventing it to expand in countries such as Spain, Poland, Czechia, France and Italy.

To the extent that the behaviour described above is the result of coordinated or concerted practices implemented by banks, it may also raise doubts as to its compatibility with competition law. As mentioned above, indeed, banks may find it profitable to align their behaviour to exclude third-party PISPs – even absent explicit coordination.

However, specific conditions must be met for these conducts to fall under either Article 101 or 102. Both collusion or concerted practices and the abuse of collective dominance require the existence of a mechanism to monitor rivals' behaviour, which requires some degree of transparency. In this case, effective monitoring that the rival banks are implementing the practices described above may be costly, but further evidence would be needed to reach a conclusion on its feasibility. The kind of punishment mechanism that would be requested to find an abusive of collective dominance – one that does not jeopardise the common objective – seems unlikely in this particular case.

If the above conditions are not met, the practices described in this section would be the result of banks' unilateral conduct. However, they may still be capable of harming open banking operators, although they could not be caught under EU competition law.

In any case, it should be considered that banks may also be incentivized by ICS to implement similar practices, as this would help ICS maintaining their market position (see section 4.1.2.2 above).

A complaint lodged to the Norwegian Competition Authority in December 2024 by Neonomics, an open banking operator, raises concerns about coordinated behaviour by banks in Norway, to the benefit of established players including ICS. The complaint alleges that Norwegian banks have coordinated and leveraged their collectively dominant position to exclude new entrants to direct debit payments, including through the application of unreasonable prices and terms for essential services under PSD2, which would also imply that banks did not comply with PSD2. According to Neonomics, established players, such as Vipps, Visa, and Mastercard (in particular, its AvtaleGiro and e-faktura payment solutions) benefitted from these practices.

### 4.3. The role of Big Techs in online payments

#### Key take-aways

- Big Tech companies have significantly expanded their role in the online payments sector. Leveraging their core businesses, such as mobile operating systems, e-commerce platforms, and social media, they have introduced digital wallets that integrate seamlessly into broader ecosystems.
- These wallets are increasingly perceived by merchants and consumers as essential payment tools, particularly in mobile-dominated shopping environments.
- The adoption of Big Tech wallets is growing across the EEA, with notable differences across Member States. In some countries Apple Pay and Google Pay have surpassed or reached some traditional online methods (e.g. Paypal) in terms of transaction value. While market penetration remains uneven, digital wallets provided by Big Techs are among the most frequently used payment methods, even when ownership is comparatively low.
- Consumer preference for smartphones in online shopping reinforces the relevance of mobile wallets. In several countries, more than 60% of consumers prefer to shop via mobile, and this trend is particularly pronounced among frequent online buyers. Big Tech wallets benefit from this structural trend, particularly where their payment solutions are pre-installed or tightly integrated into mobile ecosystems.
- Merchants increasingly view some Big Tech wallets (especially Apple Pay) as "must-have" solutions. This is attributed to the brand's strong user loyalty, the affluence of its consumer base, and the high levels of security and convenience associated with the service. These features are seen to boost conversion rates and reduce cart abandonment.
- Although Paypal remains a major player in the digital wallet segment, the data suggests it is losing ground in terms of relative share, particularly in countries where Big Tech wallets have seen rapid growth. The trajectory of Apple Pay, Google Pay, and Amazon Pay indicates a potential long-term shift in market dynamics, especially as these players continue to capitalize on their control of digital environments.
- Big Tech companies can deploy a range of practices to strengthen the market position of their payment solutions, often leveraging control over operating systems, app stores, and online platforms. These practices may result in visibility advantages, preferential positioning, and technical restrictions that hinder rival payment methods.
- These practices, if implemented, should be carefully assessed by competition authorities for their potential to harm competition in online payments, especially considering the competitive advantages that Big Tech companies may have vis-à-vis their rivals. Such advantages include their ability to bundle payment services with other digital services offered to consumers and merchants and their access to vast amounts of consumer data.

#### 4.3.1. The position of Big Techs in online payment services

The European online payment market has undergone significant transformation with the entry and expansion of Big Tech companies, driven by increasing consumer demand for convenience, security, and seamless transaction experiences. Big Tech companies include Amazon, Apple, Alphabet (Google), Meta (Facebook), and Samsung. They have introduced payment solutions that leverage their core business and extensive user bases. These

companies have not only provided payment and other retail financial services but have also introduced new business models that integrate payments into a broader ecosystem of services.<sup>293</sup>

#### 4.3.1.1. Big Tech Companies and their Business Models

During a scoping interview with industry stakeholders a domestic association of online merchants mentioned the increasing influence of Big Tech's payment methods in the online payments market (e.g. Apple Pay, Google Pay and Meta Pay), identifying as a main driver for their growth consumer demand and the provision by such players of very user-friendly interfaces. They argued that the function of Big Techs such as Apple and Google in the sector is that of a technical service provider<sup>294</sup>, facilitating the payment process for consumers and increasing convenience and safety of payments by employing biometrics for the authentication processes, without managing the payment itself. Indeed, industry participants emphasized the growing consumer preference for digital wallets that go beyond simple payment solutions. There is an increasing trend of digital wallets replacing physical wallets by integrating value-added features such as storing loyalty cards, keys, transport passes, and identification documents. Functionalities of digital wallets such as P2P payments and offline payments are also important to meet diverse consumer needs and expectations. Finally, advanced features like budget management tools were viewed as highly valuable.<sup>295</sup> Big Techs that operate in the online payment sector run business models that share some similarities but are different in several respects. We provide below a description of the features of the payment methods provided by Big Tech companies.

Amazon Pay is an online payment service integrated with Amazon's e-commerce platform. It allows customers to use their Amazon accounts to make purchases on third-party websites strengthening consumers' relationships with the Amazon ecosystem. On Amazon Marketplace, it is not offered as a separate button; instead, shoppers use the native checkout process where saved payment methods, shipping addresses, and other account details are automatically integrated. For third-party websites, Amazon Pay is offered as a distinct "Pay with Amazon" button, allowing customers to use their Amazon credentials for seamless purchases<sup>296</sup>. The objective of the service is to extend the convenience of the Amazon shopping experience to external websites. The focus of the service is on providing a one-click purchasing experience, where users' preferred payment methods are pre-selected based on prior behaviour. Amazon Pay is not tied to a mobile app, unlike competitors such as Samsung Pay and Apple Pay, though the majority of its transactions (i.e. over 50% of its payment volume) occur on mobile platforms.

Apple, primarily known for its hardware and software products, has expanded its ecosystem to include various services, including Apple Pay, a mobile wallet that allows users to make payments using their Apple devices. To facilitate the global rollout of Apple Pay, the

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<sup>293</sup> Bank for International Settlements (BIS). 2021. *Big Techs in finance: regulatory approaches and policy options*.

<sup>294</sup> Under PSD2, technical service providers (TPSs) are defined as businesses offering services "which support the provision of payment services, without them entering at any time into possession of the funds to be transferred, including processing and storage of data, trust and privacy protection services, data and entity authentication, information technology (IT) and communication network provision, provision and maintenance of terminals and devices used for payment services, with the exclusion of payment initiation services and account information services" (Article 3, point j).

<sup>295</sup> Kantar Public. 2023. *Study on Digital Wallet Features*.

<sup>296</sup> <https://pay.amazon.com/help>.

company has entered into strategic partnership agreements with a wide range of banks and financial institutions worldwide, to promote adoption and compatibility with numerous financial service providers.<sup>297</sup> This integration of hardware and software supports online, offline, and peer-to-peer transactions.

Similarly, Alphabet, the parent company of Google, has introduced Google Pay, offering a payment solution that supports online, offline, and peer-to-peer transactions. Google Pay is the only Big Tech that has an electronic money institution license in the EU, allowing it to issue electronic money and provide payment services in Europe.<sup>298</sup> Google Pay's business model is built on integrating payments into the Google ecosystem, which includes search, advertising, and Android OS.

Meta (formerly Facebook) foray into online payments includes Facebook Pay, which is primarily used for in-app purchases and donations. Facebook account holders can upload their credit or debit cards, as well as Paypal or Shopify accounts, to use for transactions within supported Facebook apps, such as Facebook, Instagram, Messenger, and WhatsApp. Unlike Apple Pay and Google Pay, payment functions can occur only while a user is viewing sites through Facebook apps.<sup>299</sup> This service is part of a broader strategy to enhance user engagement across its social media platforms and gather data to refine its advertising offerings. Transactions on its apps run on existing infrastructure and are facilitated through partnerships with Stripe and Paypal.<sup>300</sup>

Samsung offers Samsung Pay, a payment method integrated with Samsung's mobile devices and smartwatches, making it a key component of its broader strategy to build a comprehensive ecosystem of interconnected devices and services. In addition to in-store purchases, Samsung Pay supports online shopping, allowing users to select it at checkout and pay using pre-loaded credit, debit, or membership cards stored on their Samsung Galaxy smartphones<sup>301</sup>. Samsung Pay also integrates with Visa Checkout<sup>302</sup>, enabling users to make purchases at numerous online merchants.

Big Tech companies have leveraged their platforms to enter both the online and offline payment sector. This cross integration is intended to optimize user experience, strengthen customer retention, and reinforce their competitive position in the digital sector. In a scoping interview, an association representing a broad range of business models covered by PSD2 argued that the primary goal of Big Tech companies is to enhance user experience and attract users to their main business activities (i.e. their platforms), rather than the payments themselves.

To better understand the implications of these business models, both the consumer survey and the stakeholder consultations gathered indication on consumer and merchant perceptions of convenience, trust, and integration in their payment choices. This will help

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<sup>297</sup> Apple Pay participating banks in Africa, Europe and the Middle East – Apple Support (UK). (2024). Apple Support. <https://support.apple.com/en-gb/109516>.

<sup>298</sup> Netherlands Authority for Consumers and Markets (ACM). 2020. *Report - Big Techs in the payment system*.

<sup>299</sup> Congressional Research Service (CRS). 2022. *Big Tech in Financial Services*.

<sup>300</sup> Facebook, "Simplifying Payments with Facebook Pay," press release, November 12, 2019, <https://about.fb.com/news/2019/11/simplifying-payments-with-facebook-pay/>.

<sup>301</sup> <https://www.samsung.com/us/support/answer/ANS00078427/>.

<sup>302</sup> [https://sa.visamiddleeast.com/en\\_SA/pay-with-visa/featured-technologies/samsung-pay-consumer.html](https://sa.visamiddleeast.com/en_SA/pay-with-visa/featured-technologies/samsung-pay-consumer.html).

identify the key factors driving the growing adoption of Big Techs' payment solutions by consumers and their overall impact on the sector.

#### **4.3.1.2. The rise of Big Tech companies in online payments**

The evidence collected so far suggests that Big Tech wallets are becoming increasingly important for both consumers and merchants.

Table 1.6 of section 1.2.1 shows that, in 2022, there is some variation in the penetration of digital wallets across the selected EEA countries. While their penetration can differ, digital wallets rank among the top five payment methods in Austria, the Czech Republic, Denmark, France, Germany, Hungary, Italy, Portugal, and Spain when considering their total online transaction value. In some countries, including Germany, Hungary, Italy, the Czech Republic, and Denmark, they have even surpassed some traditional payment methods such as debit or credit cards, BNPL, and cash on delivery, highlighting their increasing role in the online payment sector, as discussed in section 3.3.2 above. According to Figure 3.1, digital wallets accounted for 23.85% of the total transaction value in Europe in 2022. Forecast from 1.3.2, further shows that the growth rate of the most used digital wallets in 2023 (i.e. Apple Pay, Google Pay, and Amazon Pay) is expected to surpass that of traditional payment methods, such as Credit Transfer, Credit or Charge Card and Debit Card, in the near future. Apple Pay, in particular, exhibits the highest CAGR between 2023 and 2025, with 32.31%, followed by Amazon Pay at 18.26% and Google Pay at 14.02%.

Big Techs are increasingly solidifying their roles as essential players in the online payment sector.

This trend aligns with findings from the Global Payments Report 2024, which shows that digital wallets (Big Tech's wallets and others) accounted for 18% in 2017, 45% in 2020 and 50% of the global transaction value of e-commerce in 2023. As the fastest-growing payment method in e-commerce, digital wallets are expected to experience a compound annual growth rate (CAGR) of 15% and reach a share of global transaction value of 61% through 2027.<sup>303</sup> However the report highlights that this figure is lower in Europe where more traditional payment methods (e.g cards) are still widely used by consumers. Nonetheless report projections indicate that this value could rise to 40% by 2027. These data appear to be consistent with those collected by the Project Team, although the slight discrepancy could be due to the different reference year and some variations in the country's selection<sup>304</sup>.

This growing influence of Big Techs in the online payment sector is reflected in the increasing adoption of mobile-based payment solutions and online shopping behaviours. The consumer survey results presented in Figure 2.13 of section 2.3.1.1.2 confirms that smartphones are the primary and preferred device for online shopping for 61% of respondents, especially for frequent buyers (i.e. those making online purchase more than one week (76% of them prefer smartphones to shop online) or once a week (75%)).<sup>305</sup> Given that digital wallets are widely used for online shopping on mobile devices, including

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<sup>303</sup> Worldpay. 2024. Global Payments Report 9<sup>th</sup> edition.

<sup>304</sup> Indeed, our analysis includes several European countries not featured in the Global Payments Report 2024, such as Austria, Czechia, Hungary, Greece, Latvia, and Portugal. Conversely, some countries covered in the Global Payments Report 2024, such as Belgium, Finland, Ireland, Norway, and Turkey, are not part of our dataset, which may contribute to variations in reported figures in Table 1.6 and Figure 3.1.

<sup>305</sup> See Figure 2.14.

smartphones and tablets (a trend observed for 13 out of 14 Member States according to the consumer survey), due to their convenience and perceived security over physical cards.

Data from section 1.3 reinforces this trend. The device preference table (Table 1.13) highlights that while desktops remain significant for online shopping, smartphones have become nearly as essential, with an average preference of 48% across the 14 countries surveyed. Countries such as France (81%), Poland (79%), Latvia (68%) Spain (65%), and Germany (64%) exhibit particularly strong smartphone usage for e-commerce. This shift is especially prominent in France, where smartphone preference for online shopping is more than three times higher than desktop usage (81% vs. 24%). Further insights from the split between in-app and browser payments (Table 1.14) confirm that mobile transactions constitute a significant share of online commerce. In Spain, for example, mobile payments — including both in-app (32.47%) and mobile web browser transactions (22.07%) — account for more than half of all online payments. Similarly, Italy shows a substantial reliance on mobile payments, with in-app transactions representing 36.45% of total online commerce. Even in traditionally desktop-focused countries like Germany and the Netherlands, mobile transactions still hold considerable value, with in-app payments accounting for 22.83% and 19.05% of online transactions, respectively.

While desktop platforms remain relevant, especially for high-value purchases, the increasing consumer reliance on smartphones for online shopping indicates a structural shift in e-commerce behaviour. Consequently, Big Techs are well-positioned to capitalize on this trend and continue to increase their influence in the future. In contrast, the consumer survey reveals that established players like Paypal remain more prevalent on desktop platforms, with usage rates of 40% on Mac and 58% on Windows.

In addition to this observed shift towards mobile-based payment solutions, the BIS report (2021) highlights four other key features that contribute to Big Tech's growing influence: strong network effects, the potential to become market gatekeepers, access to a large and captive user base, and their capacity to leverage big data and advanced technologies. All these factors suggest that Big Techs are well-positioned to continue expanding their role in the online payment ecosystem.<sup>306</sup>

Table 4.1 below compiles shares of value of e-commerce transactions of the selected main providers in the segment of digital wallets for 2022, based on Capgemini data presented in Table 1.6 of section 1.2.1. The table provides useful evidence for an assessment of the relative competitive strengths of individual digital wallets. However, these shares do not prejudge possible market definitions.

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<sup>306</sup> Bank for International Settlements (BIS). 2021. Big Techs in finance: regulatory approaches and policy options.

**Table 4.1: Share of value of e-commerce transaction of selected providers in the segment of digital wallets**

		AT	CZ	DK	FR	DE	EL	HU	IT	LV	NL	PL	PT	ES	SE
Pass-through digital wallet	ApplePay	7.10%	32.52%	24.91%	12.66%	14.02%	18.34%	27.32%	11.71%	31.70%	24.17%	42.73%	8.17%	8.58%	35.57%
	GooglePay	1.31%	31.61%	7.94%	7.81%	4.54%	27.55%	32.63%	6.06%	28.29%	10.86%	19.55%	16.13%	7.52%	20.37%
	MasterPass	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	SamsungPay	-	-	-	1.48%	-	-	-	-	-	-	-	-	6.62%	14.36%
	FacebookPay	-	-	-	-	-	-	-	-	-	9.69%	-	-	-	-
	MobilePay	-	-	51.78%	-	-	-	-	-	-	-	-	-	-	-
	VisaCheckout	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	CaixaWallet	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Giropay	-	-	-	-	4.12%	-	-	-	-	-	-	-	-	-
	e-Postepay	-	-	-	-	-	-	-	24.38%	-	-	-	-	-	-
	Paysera	-	-	-	-	-	-	-	-	7.65%	-	-	-	-	-
	BBVAWallet	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Staged digital wallet	ClicktoPay	0.74%	2.25%	-	0.66%	-	-	2.83%	-	-	2.88%	1.50%	-	0.48%	2.91%
	PayPal	84.04%	33.62%	15.37%	55.08%	76.29%	54.11%	37.23%	49.05%	32.37%	37.06%	36.22%	75.70%	63.24%	26.65%
	AmazonPay	6.81%	-	-	22.31%	1.03%	-	-	8.80%	-	15.34%	-	-	13.55%	0.14%
Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Note: "-" indicates that the service has been discontinued or was not launched.

Source: Project Team based on Capgemini Research Institute for Financial Services Analysis, GlobalData, Statista

Table 4.1 shows that there is some variation in the presence of Big Tech companies in the segment of digital wallets across European countries. Apple Pay, Google Pay, Samsung Pay and Amazon Pay demonstrate notable, although varied, influence across the countries analysed, with significant variations in shares of value of e-commerce transaction in 2022 across countries.

For instance, Apple Pay holds a significant position in Poland (42.73%) and Sweden (35.57%), overtaking even Paypal in these countries, as well as Czech Republic (32.52%) and Latvia (31.70%). Instead, Google Pay is most prevalent in Hungary (32.63%), Greece (27.55%), where it surpasses Apple Pay, Czech Republic (31.61%) and Latvia (28.29%). Amazon Pay appears to be prevalent in France (22.31%), Spain (13.55%), surpassing both Apple Pay and Google Pay in these countries, and the Netherlands (15.34%). Samsung Pay is only present in Sweden (14.36%), Spain (6.62%) and France (1.48%) while Facebook Pay is only present in the Netherlands, with a share of 9.69%. Additionally, there are also strong local operators, namely MobilePay in Denmark (51.78%), e-Postepay in Italy (24.38%) and Paysera in Latvia (7.65%).

It should be noted that we are not including in the segment of wallets other local solutions such as Blik in Poland, and Swish in Sweden, which in our classification fall into the category of PIS because they provide other services such as account-to-account.<sup>307</sup>

As noted in section 3.2.1, the competitive relationships among different payment methods are complex, and caution is needed when attempting to define market boundaries. While the shares discussed reflect specific segments, they are not conclusive indicators of national market trends and should be interpreted within this broader context.

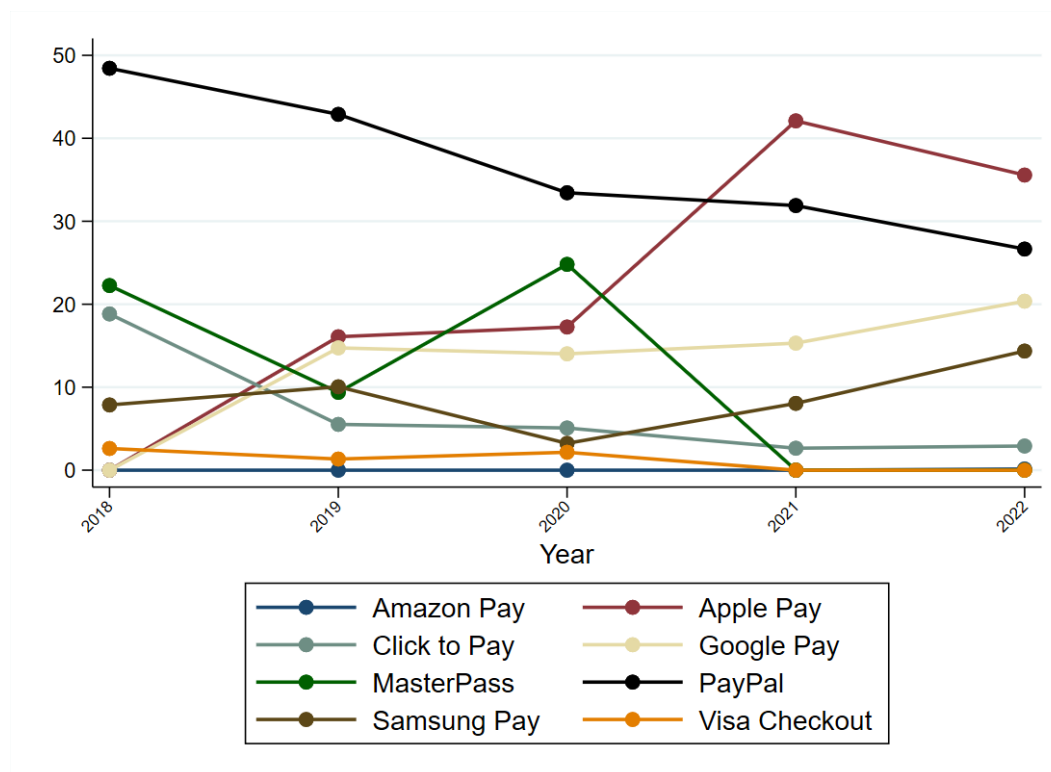
In addition, the following graphs illustrate the evolution of Big Techs' wallets and the other main wallet providers in the segment of digital wallets of the online payment sector in terms of value of e-commerce transactions between 2018 and 2022 for some of the 14 countries in our sample. However, these shares do not prejudge alternative market definitions.

In particular, we selected Sweden, Poland, Denmark, Czech Republic and Greece as an illustration of the decline of Paypal and the rise of Apple Pay, with Apple Pay even surpassing Paypal. In Sweden and Denmark, a potential driver of this trend could be the high ownership of Apple smartphones. The integration of Big Tech's wallets with the mobile ecosystem appears to be a key factor fostering their adoption, in contrast to Paypal, which is more used on desktop rather than mobile devices. However, this does not hold true in the other countries. In Poland, the Czech Republic and Greece, Apple ranks as the third-largest mobile vendor, behind Xiaomi and Samsung, suggesting that other factors are at play.<sup>308</sup> Additionally, Denmark shows similar trend but is also notable for the strong presence of a local player, MobilePay. These visual representations highlight the dynamic shifts in the competitive landscape, showcasing the varying levels of growth and adoption among Big Techs such as Amazon Pay, Apple Pay, Google Pay, and other digital wallet providers.

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<sup>307</sup> When incorporating local payment solutions, the picture changes significantly (see Annex K). In Poland, Blik holds a 78.46% share of value of e-commerce transactions, reducing Apple Pay's from 42.73% to 9.20%, Paypal's to 7.80%, and Google Pay's to 4.21%. In Sweden, Swish reaches 37.27%, lowering Apple Pay's from 35.57% to 22.31%, Paypal's to 16.72%, Google Pay's to 12.78%, and Samsung Pay's to 9.01%. In Portugal, MB WAY, with a 54.29% share, leaves Paypal at 34.60%, Google Pay at 7.37%, and Apple Pay at 3.74%. These local solutions have a substantial impact at the national level, significantly reducing the shares of other digital wallets.

<sup>308</sup> Mobile Vendor Market Share. Statcounter Globalstats. <https://gs.statcounter.com/vendor-market-share/mobile>.

**Figure 4.4: Evolution of shares of e-commerce value of transaction of digital wallets in Sweden**

Source: Project Team based on Capgemini data

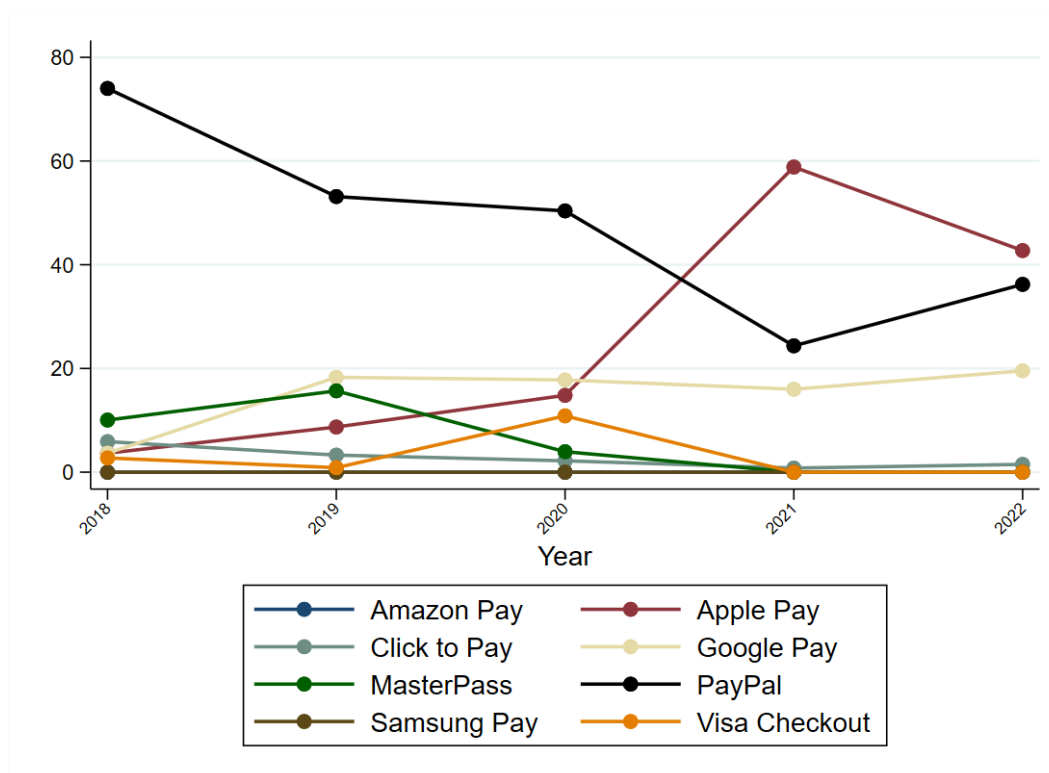
In Sweden, Apple Pay shows a significant increase, growing to more than 40% by 2021. Google Pay and Samsung Pay also see moderate growth, maintaining a steady upward rise during this period. In contrast, MasterPass experiences a sharp decline after peaking in 2020, dropping to 0% by 2021. This decline follows the discontinuation of the MasterPass mobile wallet service by Mastercard, which was officially announced in 2019 and became effective on November 16, 2021. A same trend can be observed for Visa Checkout, also discontinued in 2021. Both has been discontinued to transition to "Click to Pay", a unified digital payments service developed in collaboration by Visa, Mastercard, Discover, and American Express.<sup>309</sup> Click to Pay is a payment method that uses a single click to initiate a transaction, streamlining the checkout process for consumers. Both Visa and Mastercard are making efforts to boost the adoption of Click to Pay from consumers and merchants. For instance, Visa has integrated its Payment Passkey Service into Click to Pay while collaborating with issuers to enable Click to Pay and the Payment Passkey Service on new Visa cards, eliminating the need for manual entry of card details from the moment the card is issued.<sup>310</sup> In 2024, both Visa and Mastercard issued mandatory requirements for issuers

<sup>309</sup> The data for MasterPass and Visa Checkout is available only for certain EU countries. This is due to fragmented data availability.

<sup>310</sup> Visa Reinvents the Card, Unveils New Products for Digital Age. 2024. Visa. [https://investor.visa.com/news/news-details/2024/Visa-Reinvents-the-Card-Unveils-New-Products-for-Digital-Age/default.aspx?utm\\_source=chatgpt.com](https://investor.visa.com/news/news-details/2024/Visa-Reinvents-the-Card-Unveils-New-Products-for-Digital-Age/default.aspx?utm_source=chatgpt.com).

to implement Click to Pay, with expectations to enroll all countries globally by 2025.<sup>311</sup> During the same period, Paypal sees a notable decrease, falling from around 49% in 2018 to around 27% in 2022.

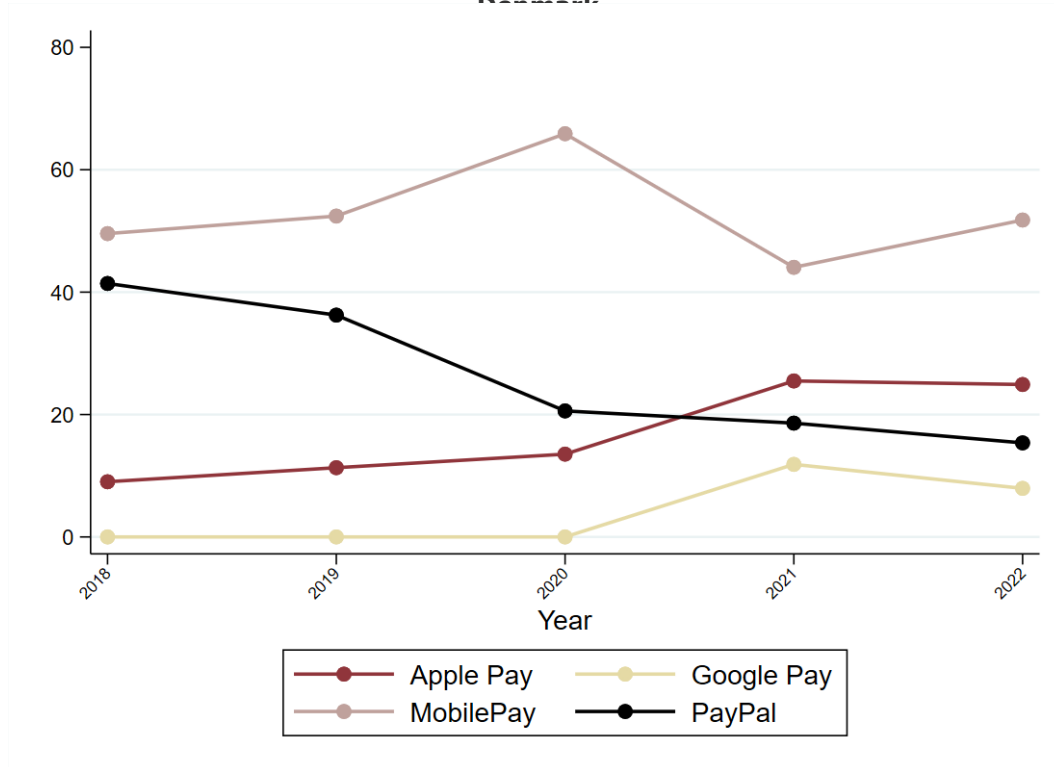
**Figure 4.5: Evolution of shares of e-commerce value of transaction of selected digital wallets in Poland**



Source: Project Team based on Capgemini data

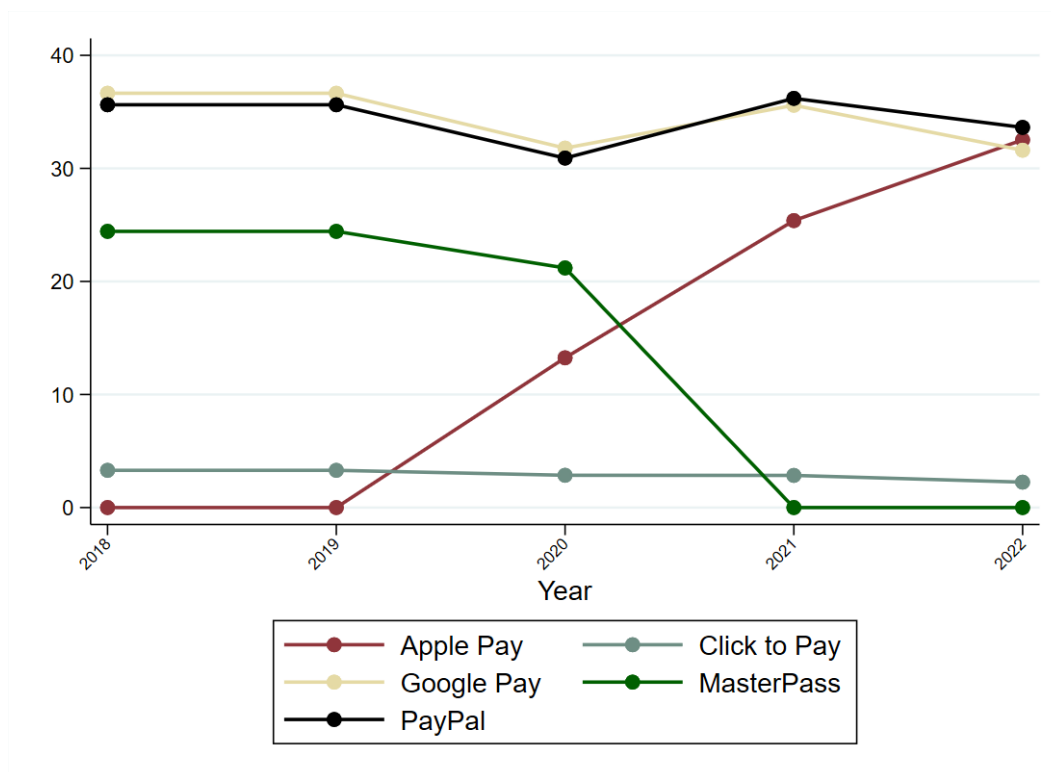
Among digital wallets in Poland, Apple Pay also demonstrates a surge in popularity, quickly rising to surpass the other wallets with a pick at around 60% in 2021 and more than 40% share by 2022. Google Pay also shows consistent growth, steadily increasing its market presence to around 20% by 2022. In contrast, Paypal, which was the most significant player with over 65% share in 2018, experiences a decline, dropping to less than 40% by 2022. Visa Checkout displays a volatile trajectory, peaking at around 18% in 2020 before being discontinued in 2021. MasterPass follows a similar pattern of decline, gradually losing shares until it disappears in 2021 and transitioned to Click to Pay which maintains a low but stable presence.

<sup>311</sup> The Rise of Online Payments and the Future of Click to Pay. 2025. Thales Group.

**Figure 4.6: Evolution of shares of e-commerce value of transaction of digital wallets in Denmark**

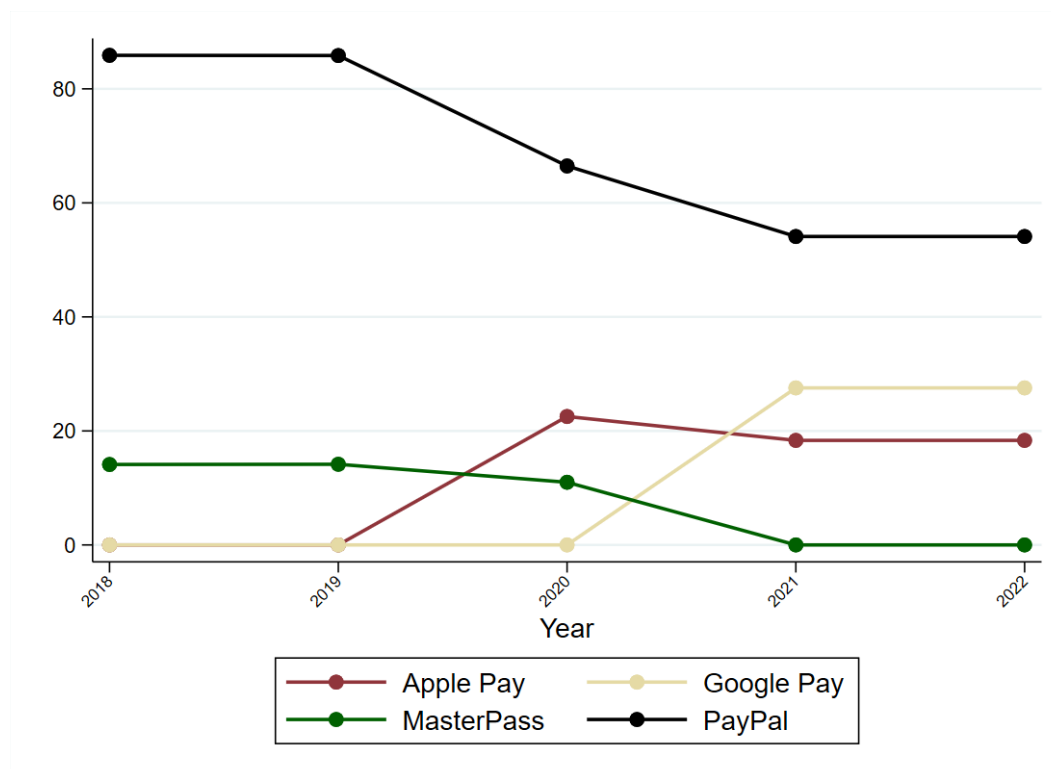
Source: Project Team based on Capgemini data

In Denmark, Apple Pay surpasses Paypal, increasing from around 10% in 2018 to about 25% by 2022. Google Pay also experiences moderate growth, though less pronounced than Apple Pay, rising to around 10% by 2022. MobilePay, a local market player, maintains a strong presence throughout the period, but with notable fluctuations according to Capgemini estimates. It starts at about 50% in 2018, peaks at over 65% in 2020, then declines to around 50% by 2022, still maintaining the largest share. Paypal, in contrast to the others, shows a consistent decline. It starts as the largest player with about 40% share in 2018, but steadily decreases to less than 20% by 2022, indicating a significant loss in popularity over the years. Big Techs, among other things, are indeed challenging Paypal established position (see section 4.4).

**Figure 4.7: Evolution of shares of e-commerce value of transaction of digital wallets in Czech Republic**

Source: Project Team based on Capgemini data

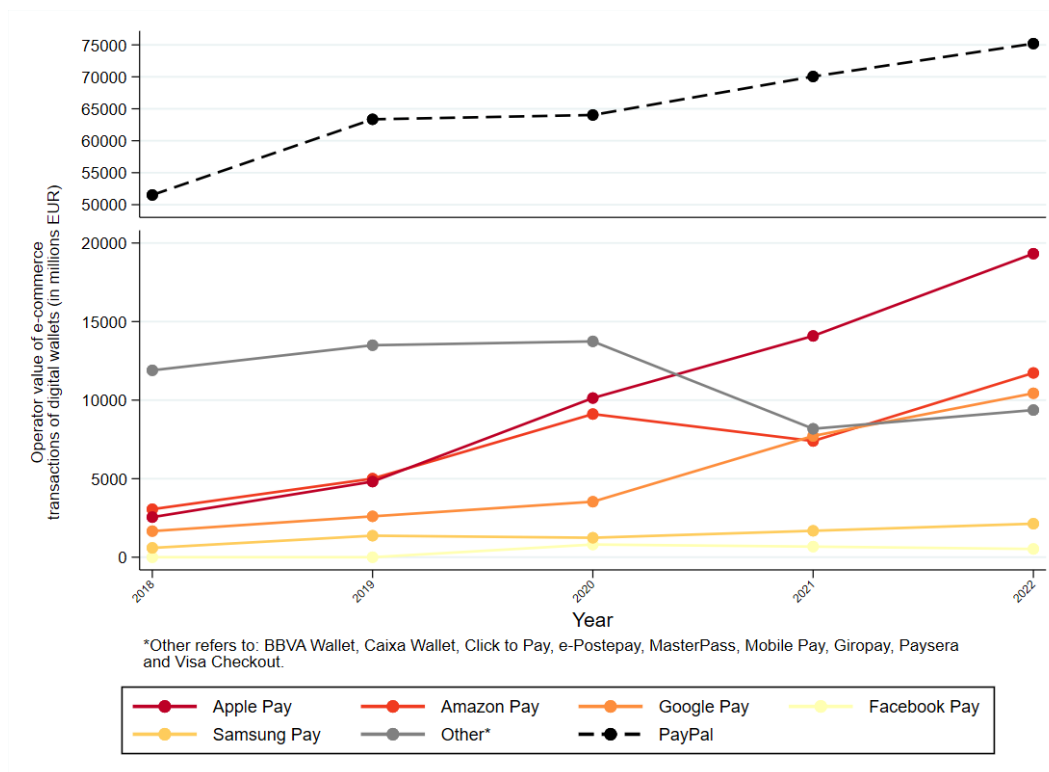
In Czech Republic, Apple Pay experiences the most significant growth among digital wallets, rising rapidly from 0% in 2019 to match PayPal shares by 2022. Instead, PayPal maintains a relatively stable share fluctuating around 30–40%, similarly to Google Pay. MasterPass follows a declining trajectory, ultimately disappearing from the market by 2021. Click to Pay establishes a small yet consistent presence.

**Figure 4.8: Evolution of shares of e-commerce value of transaction of digital wallets in Greece**

Source: Project Team based on Capgemini data

Finally in Greece, Paypal experiences a consistent and significant decline, dropping from more than 80% in 2019 to less than 60% by 2022. This decrease coincides with the rise of some Big Tech wallets, particularly Apple Pay and Google Pay. Meanwhile, MasterPass stopped its service in 2021.

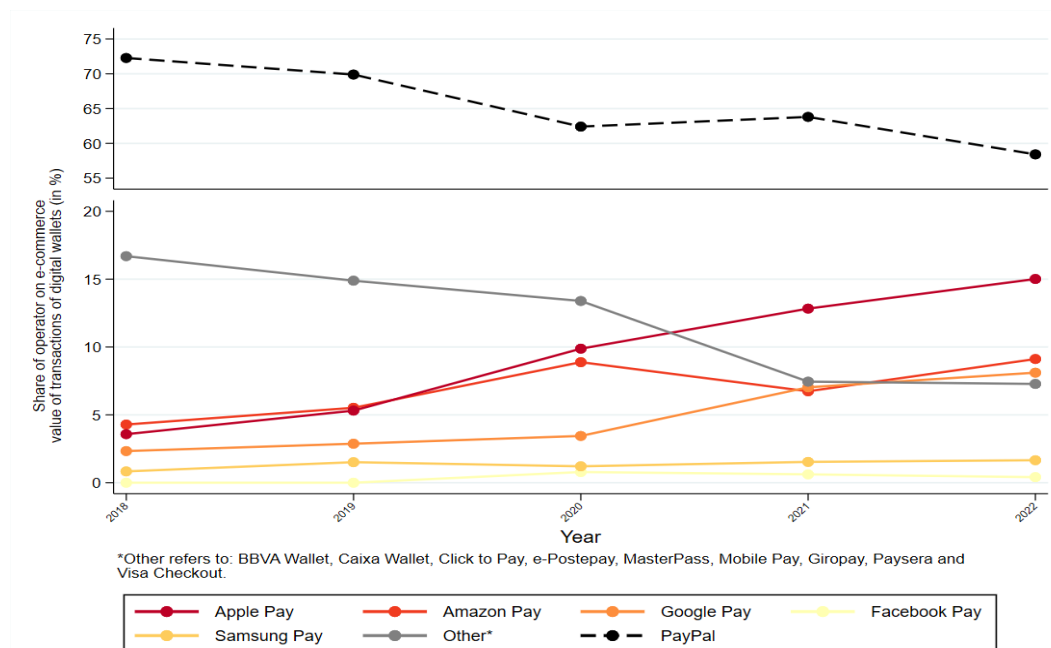
Figure 4.9 below compares the aggregated value of e-commerce transactions for the Big Techs' wallets and other wallets with that of Paypal for the 14 selected countries. The figure reveals a significant rise of Apple Pay between 2018 and 2022, overtaking all the other wallets to reach nearly 20,000€ millions in 2022. This positions Apple Pay as the most dynamic player among Big Techs' digital wallets. Similarly, Amazon Pay and Google Pay demonstrate growth, with the value of their transactions increasing, particularly in the latter years of the period, reaching approximately 13,000€ millions and 10,000€ millions respectively. In comparison, Facebook Pay and Samsung Pay remain stable, contributing to relatively low transaction values over the period. On the other hand, Paypal is the first player of this sample of digital wallets and shows an increase during the whole period, starting from more than 50,000€ millions to reach 75,000€ millions by 2022. However, the extent of this increase, although constant, is still less marked than that of Big Techs. The "Other" category, which includes various players like BBVA Wallet, Caixa Wallet, and Mobile Pay, starts strong at about 13,000€ millions in 2018 but declines in 2020, suggesting consolidation in the market or users shifting to the Big Tech companies' offerings.

**Figure 4.9: Evolution of value of e-commerce transaction of digital wallets**

Source: Project Team based on Capgemini data

When analysing aggregate shares instead of values (see Figure 4.10 below), a more pronounced trend emerges: Paypal, despite its increasing transaction value, shows an important decline over the last years, dropping from more than 70% in 2018 to less than 60% in 2022. This decrease contrasts with the constant growing shares of competitors like Apple Pay, which climbs from 4% to 15% during the same period, Google Pay which goes from around 3% to around 8% in 2022 or Amazon Pay which goes from around 4% to around 9% in 2022. In contrast, Facebook Pay and Samsung Pay maintain relatively low and stable shares throughout the period. Regarding the "Other" category, same trends can be observed as before, with a strong start at more than 15% in 2018 but a decline to around 7% by 2022, suggesting again consolidation in the segment of digital wallets or users shifting to the Big Tech companies' offerings.

The divergence between Paypal's increasing transaction value (Figure 4.9) and its decreasing share in the segment of wallets (Figure 4.10) can be explained by the rapid expansion of other digital wallets in the context of an overall expansion of e-commerce transactions.

**Figure 4.10: Evolution of shares of e-commerce value of transaction of digital wallets**

Source: Project Team based on Capgemini data

Capgemini data on the evolution of shares and value of transactions of digital wallets confirms that Big Techs' digital wallets are growing rapidly into the online payment landscape, although not all of them have succeeded to achieve the same level of popularity. However, if a Big Tech company manages to reach a wide adoption of its digital wallet and secure its role in payment verification, it could effectively become a "gatekeeper to cardholders" in the future.<sup>312</sup>

Our stakeholder consultation also suggests that digital wallets, especially pass-through digital wallets, are likely to gain momentum in the near future with 10 out of 14 providers of payment applications respondents supporting this outlook. Consequently, digital wallets offered by Big Tech companies are increasingly viewed as essential by merchants. A relevant share of them (7 out of 18 online merchant respondents) considers Big Tech's digital wallets as "must-have" solutions for their online business, which may grant Big Tech companies strong bargaining power when negotiating their condition and in particular their display on merchant sites, as will be discussed in section 4.3.2.3.1 below. Of these, 5 out of 7 specifically identified Apple Pay as a "must-have" payment solution for their online business, with respondents including prominent businesses. All five respondents indicated that their business involves online sales through their own app but among these, one uses Apple Pay on their website, one on their app, and three across both website and app. These findings, albeit based on a limited number of respondents, are further supported by insights from an interview with the PSP association reached by the Project Team, which underscores the increasing adoption and perceived indispensability of Apple Pay among merchants.

<sup>312</sup> Financial Conduct Authority (FCA). 2024. Potential competition impacts from the data asymmetry between Big Tech firms and firms in financial services.

Indication from the merchant consultation suggests that Big Tech payment solutions may benefit from different advantages related to their core business (presented in the previous section) explaining their rise in the online payment landscape. In particular, 6 out of 18 online merchants surveyed<sup>313</sup>, declared that the strength of Apple Pay is the reach among users. However, this strength can be generalized to all Big Tech platforms as their common feature is their large user base, which predominantly engages with smartphones. For instance, Apple sells significantly more iPhones (218 million units in 2018) than iPads (43 million) or Macs (18.3 million) worldwide.<sup>314</sup> Google maintains its dominance in the mobile search engine market, accounting for 94.71% of searches in 2024.<sup>315</sup> Samsung, a key player in the smartphone industry, shipped approximately 52 million smartphones in the fourth quarter of 2024, placing him among the top three smartphone vendors in the world, alongside Xiaomi and Apple.<sup>316</sup> Meanwhile, Amazon has long observed this trend, with nearly 70% of its customers shopping via mobile devices during the 2015 holiday season<sup>317</sup>. For online merchants, access to this large mobile-centric user base presents a strategic advantage. Firstly, the very size of the user base offers significant market potential. Secondly, as explained in section 2.3.1.1.2, research has shown that smartphone users tend to exhibit higher levels of impulsive buying, as they exercise less control and spend less time evaluating their purchasing decisions. Data collected through the consumer survey confirms this correlation by shedding light on a clear pattern: as the frequency of online shopping increases, the preference for using a smartphone also rises.

However, the specific mention of Apple by online merchant respondents aligns with Apple's strong brand loyalty and the higher purchasing power often associated with its user base, even if Apple's reach varies significantly by region. When examining Apple Pay's share of total e-commerce transactions conducted via digital wallets - without engaging in a formal market definition analysis - data indicate that in 2024, Apple Pay accounted for 30.35% of transactions in Italy, 26.51% in France, 34.05% in Germany, 40.89% in Austria, and 21.19% in Spain.<sup>318</sup> Despite these variations, Apple's users are frequently more affluent, more likely to engage in online shopping and adopt mobile-based payment solutions. During a scoping interview, the PSP association before mentioned stressed the fact that Apple device owners tend to be wealthier on average and might have a higher propensity to shop online than other consumers. This particularity has been demonstrated empirically by the literature. For instance, Bertrand & Kamenica (2018) highlight that owning an iPhone strongly correlates with high-income status in the US. They found that ownership of an iPhone gave a 69.1% probability of identifying the respondent as being in the top income

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<sup>313</sup> It should be noted that only 6 out of 18 merchants surveyed answered the questions on this topic. In other words, all merchants who answered at least one of the questions on this topic share this opinion.

<sup>314</sup> GlobalData. Apple: Yearly Unit Sales of Products (2006 – 2018, Millions). <https://www.globaldata.com/data-insights/technology--media-and-telecom/apple-yearly-unit-sales-of-products/>.

<sup>315</sup> GlobalStats statcounter. Mobile Search Engine Market Share Worldwide. <https://gs.statcounter.com/search-engine-market-share/mobile/worldwide/#yearly-2022-2025>.

<sup>316</sup> Statista. 2025. Global smartphone unit shipments of Samsung 2010-2024, by quarter. <https://www.statista.com/statistics/299144/samsung-smartphone-shipments-worldwide/>.

<sup>317</sup> Time. 2015. More People Now Shop on Amazon Using Smartphones and Tablets Than Computers. <https://time.com/4162188/amazon-holiday-shopping-statistics-2015/>.

<sup>318</sup> Mobile Vendor Market Share. Statcounter Globalstats. <https://gs.statcounter.com/vendor-market-share/mobile>.

quartile, with iPad ownership yielding a similar result (66.9%).<sup>319</sup> This reflects the higher cost of Apple products compared to alternatives like Android devices, which are more commonly associated with lower-income users. This helps to explain why merchants see Apple Pay as a significant advantage for their online business, as its user base is more prone to spend online, even in regions where Apple's share of users is lower.

An additional specific strength of Apple Pay, highlighted by both online merchants who responded to this question is the enhanced security it can provide, first for users but also for online merchants. This feature, central in Apple's offerings, is a cornerstone of the company's marketing strategy and resonates strongly with consumers. This high level of security is enabled by Apple's closed ecosystem, although this can raise competitive concerns and in particular as regards to access to this ecosystem by competitors (as will be discussed in the section 4.3.2.1 below), which integrates hardware, software, and services "designed to work together for maximum security [...] in service of the ultimate goal of keeping personal information safe".<sup>320</sup> Open-ended responses from merchants also provided insights on the strengths of Apple Pay: one merchant stated that "Apple Pay authentication imposes less friction than card scheme 3DS authentication," while another highlighted its "frictionless customer experience". One respondent simply described Apple Pay as offering "convenience". While these insights are drawn from a limited number of respondents, they align with the consumer survey detailed in section 2.3.1.1.2 and can be extended to other Big Tech's wallets. According to the latter, 45% of respondents consider payments via digital wallets to be safer than traditional debit or credit cards (see Figure 2.15). However, others either disagree or remain uncertain, suggesting that while digital wallets are widely valued for their convenience, their security is not universally trusted. Furthermore, 62% of respondents of the consumer survey believe that when shopping online, most people value convenience over safety, giving an advantage to Big Techs' wallets whose offerings are centered on convenience (see Figure 2.19). The importance of consumer preferences in driving merchant adoption of payment methods, as explained in section 3.2.1.1 can also be a major factor explaining the rise of Big Tech's digital wallets in general.

According to the PSP association, Apple Pay is experiencing increasing growth, and it is considered difficult to replace by merchants, whereas Google Pay holds a less prominent position. The association suggests that the greater success of Apple Pay with respect to Google Pay could depend on the fact that the former offers a tighter integration of its wallet with iOS devices. However, this may lead to higher lock-in of users within the Apple ecosystem. The association also explained that originally, when Apple Pay was launched, it offered a very advanced technical setup which allowed merchants not to make any modifications to their infrastructure to make it compatible with Apple Pay. Specifically, at its launch, Apple Pay worked with the three major payment networks, American Express, MasterCard and Visa, making it easier for merchants to adopt. For online merchants, transactions conducted via Apple Pay are processed similarly to traditional card payments since the beginning<sup>321</sup>. The association finally noted that currently Google Pay has adapted, by offering a similar solution to merchants. However, it should be noted that some integration steps, particularly for online environments such as Apple Pay on the Web, do

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<sup>319</sup> Bertrand, Marianne, and Emir Kamenica. 2023. "Coming Apart? Cultural Distances in the United States over Time." *American Economic Journal: Applied Economics*, 15 (4):100–141.

<sup>320</sup> Apple Platform Security. 2024. [https://help.apple.com/pdf/security/en\\_US/apple-platform-security-guide.pdf](https://help.apple.com/pdf/security/en_US/apple-platform-security-guide.pdf).

<sup>321</sup> Apple Announces Apple Pay. (2014). <https://www.apple.com/newsroom/2014/09/09Apple-Announces-Apple-Pay/>.

require technical adjustments on merchant websites. These involve implementing specific APIs and ensuring compliance with Apple's developer guidelines for integrating payment buttons and transaction flows<sup>322</sup>.

Consumer survey results in section 2.3.1.2.1 indicates that, despite their relatively low adoption rates among consumers, Big Tech wallets demonstrate a high frequency of use among their owners. This suggests that users who adopt these payment solutions integrate them into their regular online transaction habits, contributing to their increasing share in overall transaction value. Consumer survey results (see Figure 2.27) reveal that Google Pay and Apple Pay are owned by only 19% and 13% of respondents, respectively. However, they rank among the most frequently used payment methods in half of the surveyed Member States (specifically Czechia, Germany, Greece, Spain, France, the Netherlands, and Poland) despite not being among the most widely owned payment methods in these countries. Their average frequency of use scores at 3.4 and 3.7 respectively (on a scale from 1, "almost never," to 5, "almost always"), highlighting their regular usage among users. This stands in contrast to more widely adopted payment methods such as Paypal, which, despite its high ownership rate, shows a lower frequency of use (only 15% of its users report using it "always"). Notably, Apple Pay emerges as a particularly entrenched payment solution, appearing among the top three most frequently used payment methods in more countries compared to Google Pay. The habitual and consistent use of Big Tech wallets suggests that, for a segment of online consumers, these methods serve as primary transaction instruments, reinforcing their growing role in the digital payment ecosystem. Consequently, while traditional penetration metrics may underestimate their overall market influence, frequency-based measures provide a clearer indication of their increasing significance in online transactions.

#### **4.3.2. The practices employed by Big Techs to leverage their proprietary platforms in the online payment sector**

There are structural features in the online payment sector – namely indirect network effects, brand recognition, technical barriers, fragmentation in the implementation of regulation, as developed in section 3.2.2, which make it difficult to challenge the market position of established players such as ICS and Paypal.

This raises the question of how Big Techs companies managed to achieve such rapid growth and market relevance considering these features. By leveraging their expansive ecosystems, brand recognition, and access to consumer data, these companies have rapidly developed new payment solutions, some of which are widely used today. A likely explanation lies in their ability to draw upon the advantages of their core business and their influence over digital ecosystems. By offering digital products and services that consumers rely on daily (such as mobile operating systems, search engines, marketplaces and social networking platforms) these companies have positioned themselves as key commercial players, enabling them to control the environments where online transactions take place. Big Tech firms also benefit from vast customer bases and networks effects, while leveraging advanced technologies, including artificial intelligence, biometric authentication, and their extensive data capabilities, to enhance their payment services. Through their strengthened position, Big Tech companies could also make use of opportunities such as the future Digital Euro (see Box 4.4).

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<sup>322</sup> Apple Pay Merchant Integration Guide. <https://developer.apple.com/apple-pay/Apple-Pay-Merchant-Integration-Guide.pdf>.

#### Box 4.4: Big Tech companies and Digital Euro

The Digital Euro is a proposed central bank digital currency (CBDC) issued by the European Central Bank (ECB), intended to serve as an electronic equivalent to cash. It aims to provide a secure, universally accepted digital payment option for consumers and businesses across the euro area, functioning alongside physical cash. Designed to enhance strategic EU payment independence, an institutional monetary anchor in a digitized world, financial inclusion, payment efficiency, and consumer trust, the Digital Euro would offer a public alternative to (and overlapping with) private digital payment systems, with features like high privacy standards and both an online and offline functionality.

Concerning privacy standards, the aim of the Digital Euro is to offer cash-like privacy levels for offline transactions; and enhanced privacy protection with respect to some of the existing private digital payment systems for online transactions, through pseudonymization of user data and a commitment by the Eurosystem<sup>323</sup> to never use user data for commercial purposes. Unlike private payment providers, the Eurosystem indeed has no commercial interest in using or monetizing user data; intermediaries such as banks and PSPs, however, would still have access to the users' personal data but would need their consent to use it for commercial purposes.<sup>324</sup> A European issuing bank interviewed by the Project Team noted that, based on currently available information, meeting enhanced privacy standards for online transactions seems unlikely.

Big Techs could in principle – if interested – distribute the Digital Euro, similarly to ASPSPs and other PSPs. During an interview with a European issuing bank, it has been argued that Big Tech companies could exploit their vast customer bases and digital ecosystems to gain a competitive edge in this respect, owing to the quality of their interfaces, and, above all, thanks to the current provisions of the draft regulation on the compensation model,<sup>325</sup> making their platforms even more attractive to users. In turn, the distribution of the Digital Euro by Big Techs would contribute to its usage by consumers, although according to the issuing bank interviewed by the Project team the involvement of Big Techs is unlikely to allow the Digital Euro to have a higher reach among consumer than what could be achieved through the distribution by "traditional" PSPs. The issuing bank also expressed the concern that such involvement by non-European Big Tech entities may undermine the strategic objective of preserving European autonomy and sovereignty in the payment ecosystem.

In competition with Big Techs, commercial banks are also expected to play a central role in distributing the Digital Euro. Acting as the main point of contact for individuals, merchants, and businesses, banks would perform end-user services and, according to the bank interviewed by the Project Team, can risk managing digital euro-related issues, even when a different distributor is present, due to their historical role vis-à-vis customers. Additionally, the Digital Euro could become a real euro acceptance tool, overcoming the limitations of domestic markets.<sup>326</sup>

*Source: Project Team*

Big Techs' control over the digital environment and their capacity to leverage it may potentially raise several competition concerns. In the following sub-sections, we delve into the strategic actions that Big Tech firms might pursue by leveraging their position in non-financial markets to establish and expand their footprint in financial services. The focus will be on how such actions might alter the competitive landscape, particularly through practices that could potentially limit access to other players, favour proprietary solutions, and create dependencies. The analysis will also be informed by the discussion held with main stakeholders during the consultations, and the indication provided through the questionnaires. The latter encompass the perspectives of merchants, card schemes and

providers of payment applications, offering valuable insights into the market dynamics from their vantage points. The behavioural experiment illustrated in Chapter 2 provides insights on the most important factors that determine the decisions consumers make when they select payment methods in the online space and shed light on the relevance and effects of display practices on this choice (see section 2.3.2.1.1). This multi-faceted approach, incorporating views from diverse stakeholders, allows us to provide a comprehensive understanding of the potential ability of Big Techs to influence competition, innovation, and consumer choice in the online payment ecosystem.

#### **4.3.2.1. Potential restrictions of access to major digital platforms controlled by Big Techs**

Big Tech companies play a significant role in shaping digital ecosystems, providing a range of products and services integrated seamlessly into the lives of consumers. Companies like Apple and Google dominate the mobile operating systems in the EU, granting them control over app stores, which are the primary distribution channels for digital applications. Meta operates through platforms such as Facebook, Instagram, and WhatsApp, facilitating consumer-merchant interactions and enabling sales through features like Facebook Marketplace. Amazon, as the leading online marketplace in the EU, exerts influence over merchant-consumer transactions. Similarly, Samsung leverages its ecosystem of interconnected devices and strong brand loyalty to promote proprietary tools and services.

Big Tech companies, due to their influence, are able to impose conditions for accessing their platforms or restrict such access altogether. However, they would have incentive to do so to the extent such practice, by foreclosing competitors in the online payment sector, allows them to expand their profits in the digital payment sector without significant losses in the vertically integrated markets (e.g. operating system and app stores). Indeed, limiting consumer choice of payments methods on their platforms might lead to losses in vertically integrated services, which may reduce the incentive to engage in foreclosing practices.

A key example is Apple's restriction of NFC technology on iOS devices, which prevents competitors from deploying their own digital wallets for in-store (not online) payments. This restriction demonstrates how Big Tech platforms may leverage their ecosystems by diverting consumer transactions to proprietary solutions like Apple Pay.

Up to July 2024,<sup>327</sup> Apple did not open its NFC chip in Apple devices, preventing banks from using their own e-wallets on Apple hardware. In June 2020, the European Commission opened an investigation into Apple Pay, expressing concerns about Apple's limitation of access to the Near Field Communication (NFC) functionality on iPhones and Apple's terms

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<sup>323</sup> Consisting of the ECB and national central banks in the euro area.

<sup>324</sup> [https://www.ecb.europa.eu/euro/digital\\_euro/features/privacy/html/index.en.html](https://www.ecb.europa.eu/euro/digital_euro/features/privacy/html/index.en.html).

<sup>325</sup> The draft regulation requires that digital euro services remain free or very low-cost for consumers, ensuring widespread accessibility and financial inclusion. To enable this, the Regulation establishes a compensation framework where intermediaries, such as banks, PSPs, electronic money institutions, and potentially Big Tech platforms acting as wallet providers, are remunerated by the Eurosystem or through low, capped merchant fees. This compensation covers operational costs like onboarding, transaction processing and compliance, allowing intermediaries to sustainably provide digital euro wallets and payment services.

<sup>326</sup> European central bank. 2024. FAQs on a digital euro. [https://www.ecb.europa.eu/euro/digital\\_euro/faqs/html/ecb.faq\\_digital\\_euro.en.html](https://www.ecb.europa.eu/euro/digital_euro/faqs/html/ecb.faq_digital_euro.en.html).

<sup>327</sup> Antitrust Procedure: Council Regulation (EC) No 1/2003, Article 9 Regulation (EC) 1/2003. (2024). [https://ec.europa.eu/competition/antitrust/cases1/202441/AT\\_40452\\_10269725\\_10183\\_3.pdf](https://ec.europa.eu/competition/antitrust/cases1/202441/AT_40452_10269725_10183_3.pdf).

and conditions for the integration of Apple Pay in apps and websites on Apple devices. These practices might distort competition in the online payment market. Apple justifies its strict controls by arguing that it protects the security and privacy of its users. This rationale has been questioned as similar payment technologies are offered independently of Apple's services on other platforms without compromising security.<sup>328</sup> The Commission concluded preliminarily that Apple abused its dominant position by refusing to supply the NFC input on iOS to competing mobile wallet developers, while reserving such access only to Apple Pay. In the decision of 11 July 2024<sup>329</sup>, Apple committed to allowing third-party wallet providers access to the NFC input on iOS devices free of charge by applying a fair, objective, transparent and non-discriminatory procedure and eligibility criteria to all third-party mobile app developers and iOS users established in the EEA for 10 years. However, according to one respondent to our payment application provider consultation Apple NFC implementation is still complex.

NFC technology is integral to the competitive landscape because it facilitates contactless payments at physical points of sale. Although NFC is not directly required for online transactions, it enhances the overall utility of e-wallets by enabling seamless usage across physical and digital environments. Without NFC access, digital wallets, such as Paypal, are confined to online transactions, making them less attractive for consumers compared to Big Tech's digital wallets, which integrates both physical and digital payment functionalities. In this context, eight out of thirteen PSPs view obstacles to access the NFC chip on certain devices, driven by the behaviour of competitors or other market players, as a major barrier to offering a comprehensive payment solution. They indeed consider that restricted access to NFC technology limits their ability to enter or expand in online payments market by leveraging usage by consumers for offline payments.

Unlike other systems that are more open, Apple also used to impose strict guidelines and limitations on how third-party payment services can be integrated into apps distributed on the App Store in the EU across iOS. For instance, developers could use alternative payment service providers (PSPs) only if they agreed to specific terms and accept that certain OS or App Store features may not function as expected. Furthermore, alternative PSPs could not be used alongside Apple's In-App Purchase system on the same EU storefront and platform.<sup>330</sup> In this sense, a payment application provider reported in our questionnaire that the process for App certification and approval of new features in Apple devices is complex and long compared to other operating systems. This serves as an example of a strategic action that could provide Apple Pay with a competitive advantage in the online payment sector when users make purchases through Apple devices.

Further illustrating the competitive challenges in this ecosystem, a domestic e-retailer association provided examples of merchants being bound to specific payment methods according to the strict terms and conditions imposed by Apple to developers which want to be present in the App Store. In particular, dating-app providers such as Tinder, were imposed additional fees to those paid to be present in the Apple's App store. These providers were unable to choose a payment system for consumer purchases made within their apps. The ACM has intervened to address these issues by ordering Apple to adjust

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<sup>328</sup> Antitrust: Commission opens investigation into Apple practices regarding Apple Pay. European Commission. 2020. [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_20\\_1075](https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1075).

<sup>329</sup> Antitrust Procedure: Council Regulation (EC) No 1/2003, Article 9 Regulation (EC) 1/2003. (2024). [https://ec.europa.eu/competition/antitrust/cases1/202441/AT\\_40452\\_10269725\\_10183\\_3.pdf](https://ec.europa.eu/competition/antitrust/cases1/202441/AT_40452_10269725_10183_3.pdf).

<sup>330</sup> Apple Inc. Distributing apps using alternative payment options in the European Union - Support - Apple Developer. <https://developer.apple.com/support/apps-using-alternative-payment-providers-in-the-eu/>.

the unreasonable conditions in its App Store that apply specifically to dating-app providers. Martijn Snoep, Chairman of the ACM Board, elaborates on the importance of this action:

“Some app providers are dependent on Apple’s App Store, and Apple takes advantage of that dependency. Apple has special responsibilities because of its dominant position. That is why Apple needs to take seriously the interests of app providers too, and set reasonable conditions. That is what we are forcing Apple to do with this order. Protecting people and businesses against abuse of market power in the digital economy is one of our most important duties.” Under the ACM’s order, Apple must allow dating app providers to use payment systems other than Apple’s and permit these providers to reference external payment options within their apps. If Apple fails to make the required adjustments within two months, it faces a periodic penalty of 5 million euros per week, up to a maximum of 50 million euros.<sup>331</sup>

In response to the Digital Markets Act (DMA), Apple has implemented new options to comply. This includes enabling sideloading so that EU users can download apps through alternative app marketplaces outside the App Store. Additionally, Apple has introduced alternative payment processing methods on the App Store. For apps available on the App Store across Apple’s operating systems in the EU, developers now have the option to use alternative PSPs or direct users to complete transactions on their external websites. These updates also include user experience enhancements, such as informational banners on app product pages and disclosure requirements before transactions are completed with alternative payment options. These changes aim to increase transparency and provide more choices to developers and users within the EU.<sup>332</sup>

The consultation with stakeholders revealed several concerns about such restrictive practices from Big Techs. Ten out of thirteen providers of payment applications respondents reported that restricted access to NFC chips is a significant barrier to deploying competitive payment solutions. However, the release of iOS 17.4 and Apple’s commitments have enabled access to NFC technology to be managed via the cloud using Host Card Emulation (HCE)<sup>333</sup>. HCE allows applications on a mobile device to leverage the device’s NFC interface to communicate directly with contactless terminals without need to negotiate terms with the security element issuers when deploying a payment application using NFC technology.<sup>334</sup> Once again it must be emphasised that this practice does not directly concern online payments.

Restricted access to NFC technology is not the only area of concern. Two providers of payment applications respondents reported restrictions on the use of Apple’s secure elements (which are microprocessor chips that can store sensitive data and run secure apps such as payment) generally present in smartphones or SIM cards. As explained by one of the respondents, access to secure elements is a critical function for online payment methods and a requirement for creating competitive both online and offline payment solutions. Even if tokenization and HCE serve different purposes (i.e. tokenization enhances security, while HCE enables NFC functionality), they are complementary in practice. HCE,

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<sup>331</sup> ACM obliges Apple to adjust unreasonable conditions for its App Store. (2021). ACM - Murco Mijnlief. <https://www.acm.nl/en/publications/acm-obliges-apple-adjust-unreasonable-conditions-its-app-store>.

<sup>332</sup> Apple’s Non-Confidential Summary of DMA Compliance Report. <https://www.apple.com/legal/dma/dma-ncs.pdf>.

<sup>333</sup> HCE-based contactless NFC transactions for apps in the European Economic Area (EEA). Apple. <https://developer.apple.com/support/hce-transactions-in-apps/>.

<sup>334</sup> Driving Forward with Tokenization and HCE: An SPA Position Paper. 2014. Smart Payment Association.

by itself, is not secure enough to store static payment credentials for long periods. Tokenization addresses this limitation by generating dynamic, single-use credentials specifically for transactions.<sup>335</sup> These limitations provide Big Tech firms with a decisive edge over competitors, further entrenching their market power.

In addition to restrictions on hardware access, four providers of payment applications respondents reported facing technical constraints, compulsory bundling of services, and additional fees imposed by platforms such as Google, Amazon, Samsung, and Apple without giving further details in the questionnaire. In an interview with a European domestic provider, it described similar challenges to those reported in the questionnaire, providing further insights into the dynamics at play. Specifically, the provider noted that Big Tech companies leverage their indispensability to exercise significant bargaining power, enabling it to impose specific conditions. For example, Apple requires strict adherence to high usability standards to maintain a premium user experience. Amazon, on the other hand, demands a modular approach to accommodate multiple merchants, each with varying requirements. As for Google, while their approach mirrors Apple's in some respects, they are generally less restrictive. However, providers of payment services cannot feasibly rebuild their payment options to meet the specific requirements of each platform. These practices increase the cost and complexity of offering competing payment solutions, limiting their competitiveness and stifling innovation.

Additionally, a provider of payment application stated that restrictions imposed by Apple prevent its application from implementing features similar to those offered by Apple's own services, further limiting its competitiveness on iOS devices. More specifically, if Apple offers an equivalent feature for iOS, the provider application is either prohibited from using its own feature on iOS devices or required to utilize Apple's feature instead. However, the provider did not detail the features concerned in its open response.

Visibility restrictions imposed on specific payment methods present another dimension of concern. A French merchant, for instance, noted that certain payment methods generally accepted on its website or app were restricted on platforms such as Apple's. Domestic payment cards were particularly affected, with their visibility limited since co-branded cards are not supported natively by Apple's platforms which is most of the case for cards in France (Cartes Bancaires). These actions distort consumer choice by reducing the prominence of alternative payment options, effectively steering users toward Big Tech's proprietary solutions.

The integration of Big Tech wallets into broader ecosystems confers them a decisive competitive advantage. Apple Pay and Google Pay, for example, provide seamless integration of payment cards across both physical and digital channels, making Big Tech wallets more appealing to consumers and contributes to their growing significance, often at the expense of standalone competitors.

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<sup>335</sup> Driving Forward with Tokenization and HCE: An SPA Position Paper. 2014. Smart Payment Association.

#### **Box 4.5: Restricted access and Digital Markets Act**

Big Tech firms, classified as "gatekeepers" under the EU Digital Markets Act (DMA), face obligations designed to address the practices that have distorted competition in markets such as online payments. Article 5(7) explicitly prohibits gatekeepers from requiring business users or end users to use their proprietary payment systems or technical services supporting such systems.

Furthermore, Article 6(7) mandates that gatekeepers allow third-party providers free and effective interoperability with hardware and software features controlled by the gatekeeper, such as operating systems or device elements like secure elements for payment tokenization. In the context of Apple's former policies, this provision ensures that rival wallets, such as Paypal or Samsung Pay, would gain equal access to essential functionalities like NFC chips, or tokenization features, which are important for both online and offline payment solutions.

The DMA also addresses the systemic issues raised in the stakeholder consultation, where multiple providers reported technical constraints, compulsory bundling, and additional fees imposed by Big Tech platforms. By requiring interoperability and banning restrictive conditions, the DMA aims to level the playing field, eliminating practices such as the bundling of Apple's In-App Purchase system with app distribution or visibility restrictions that favour proprietary payment methods over domestic cards or competing solutions.

*Source: Project Team*

#### **4.3.2.2. Data Integration Across Services: A Competitive Edge**

Big Tech companies, through their control of major digital platforms, possess unparalleled access to vast amounts of user data, which they could leverage either by entering in partnership with incumbents, selling data or offering key services such as data analysis or cloud services, or by offering their own online payment method directly to consumers. This capability allows them to combine payment-related data with a wide array of consumer and personal data, enabling a comprehensive understanding of consumer behaviour, choices and preferences. This may create a competitive advantage with respect to traditional commercial banks.

While APSPs fall under transparency and data-sharing requirements under PSD2, which mandates open access to certain payment data for third-party providers, Big Tech firms do not provide bank account services and therefore do not have such obligations. ASPSPs have argued they would need access to the unrelated and more extensive data sets of Big Techs to ensure a level playing field.

Reports from both the Financial Conduct Authority (FCA) and the European Securities and Markets Authority (ESMA) underscore the advantages Big Tech firms derive from aggregating data across their services. According to the FCA's Feedback Statement FS23/4, in the UK, several interviewees pointed out that a competitive advantage of Big Techs is their access to unique datasets that traditional financial service providers typically do not have. Through their business model based on the "data-network-activity loop" and their other services (e.g. social media, search engine, marketplace), Big Techs have access to extensive user data, which can be used to push the adoption of their online payment methods and combined to provide a comprehensive view of consumer behaviour and

preferences<sup>336</sup>. In this context, the FCA is concerned that “Big Tech firms’ gatekeeper role downstream, along with their access to consumer data through digital wallets, could further reinforce the criticality of their cloud, data, and AI services upstream”.<sup>337</sup>

Most of respondent of the FCA’s Discussion Paper argued that specific characteristics of Big Techs’ existing online businesses, such as their ability to leverage vast amounts of client data, facilitate their entry into the financial sector (provided they hold appropriate licences to perform regulated services or provide their services in partnership with financial institutions that meet the regulatory requirements). This allows them to offer “rewards, incentives, and discounts through their existing ecosystems of products and services to consumers”. The ESMA’s Report on Trends, Risks, and Vulnerabilities (2020) highlights that these ecosystems, along with the ability to integrate data from different services, enhances the value proposition of Big Techs’ payment solutions. Companies like Amazon, Facebook, and Google originate from diverse digital services sectors (e-commerce, social media, and search engines, respectively). Despite their varied origins, Big Techs share the ability to use extensive customer data to potentially offer a range of financial services directly to clients. This data forms the backbone of their core business models, which may involve targeted advertising or personalized features within their platforms. The integration of data across different services, such as Google combining insights from Google Search, YouTube, and Google Pay, enables these companies to understand individual client needs and preferences better than traditional financial institutions.<sup>338</sup> This capability not only provides a better user experience but may also create barriers for competitors who do not have access to similar data volumes or analytical capabilities. This data-driven approach would allow for the personalization of financial services, a trend that aligns with shifting consumer behaviour and expectations for tailor-made products.<sup>339</sup>

However, the full implications of the use of extensive databases by Big Techs for their online payment methods are not yet fully evaluated. It is more straightforward to imagine that the primary use of such data by Big Tech companies is inversed, meaning that they can leverage the data collected through their payment services to enhance their core businesses, such as search engines, social media platforms, and online marketplaces.

This ability to integrate payment data with broader digital ecosystems not only enhances their competitive position but also allows them to extract greater value compared to traditional financial institutions. In contrast, banks, which lack comparable access to such extensive consumer data, may find themselves at a disadvantage in negotiating access to these payment ecosystems. As digital wallets become increasingly central to consumer online transactions, banks must ensure their payment instruments remain compatible with these solutions, even if doing so comes at a high cost. Apple’s strong negotiating power exemplifies this dynamic, enabling it to impose what major banks consider an excessively high price for access to Apple Pay.<sup>340</sup> Moreover, Big Tech firms hold an additional advantage over issuing banks in relation to other wallets, as they may provide supporting services for

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<sup>336</sup> Bank for International Settlements (BIS). 2023. Big Techs in finance.

<sup>337</sup> FCA. 2024. Potential competition impacts from the data asymmetry between Big Tech firms and firms in financial services.

<sup>338</sup> ESMA. 2020. Financial stability and investor protection BigTech – implications for the financial sector.

<sup>339</sup> Pollari, I., & Raisbeck, M. 2017. Forging the Future: How Financial Institutions Are Embracing Fintech to Evolve and Grow, KPMG.

<sup>340</sup> Netherlands Authority for Consumers and Markets (ACM). 2020. *Report - Big Techs in the payment system*.

SCA, such as biometric authentication and enter outsourcing agreements with banks for this purpose.

Through stakeholder consultations, nine out of thirteen providers of payment applications expressed specific concerns about Big Techs' ability to merge data from diverse sources. These include mobile and desktop hardware, operating systems, artificial intelligence tools, entertainment and streaming platforms, app stores, advertising services, cloud services, online marketplaces, social media platforms, and search engines.

During a targeted interview, a European domestic provider expressed concerns about the possibility for Big Techs to leverage the data they collect through their ecosystems. The provider contrasted the approach of its own payment solution, which does not store and use personal data, with the one of Paypal or Google, which operate data-driven ecosystems. One provider of payment application respondent highlighted specific apprehensions related to the proposed Financial Data Access (FIDA) regulation. It argued that while FIDA seeks to enhance consumer protection, its provisions may inadvertently favour Big Tech companies by not holding them accountable for responsibilities within their control. For example, PSPs are held liable for instances of fraud occurring on Big Tech platforms, even though these platforms are owned and controlled by Big Tech companies, which can implement measures to prevent such fraudulent activities. This underscores the need for balanced regulatory frameworks to ensure fair competition and robust consumer protection.

**Box 4.6: The use of data in the Digital Markets Act**

Under the DMA, Big Tech firms designated as gatekeepers face strict obligations to address concerns arising from their data integration practices, which have been identified as a major source of competitive advantage in the financial services sector through our stakeholder consultations. Article 6(2) prohibits gatekeepers from using non-public data generated by business users or their customers on core platform services to compete against those business users. This provision directly targets practices where companies like Google or Amazon could leverage aggregated consumer data from their ecosystems, such as search, e-commerce, or cloud services, to gain an unfair edge in providing financial services. These practices align with concerns raised by payment providers during stakeholder consultations, which highlighted Big Tech's ability to integrate payment data with broader consumer data from platforms like app stores, advertising services, and social media.

Additionally, Article 5 explicitly prohibits gatekeepers from combining personal data across their various services without explicit user consent. For example, a gatekeeper cannot merge consumer data collected from social media platforms with data from digital wallets or payment systems to develop targeted financial products unless authorized by the user. This directly refers to scenarios noted by stakeholders, such as the ability of Big Tech firms to merge consumer data from platforms like social media with payment systems to develop highly targeted financial products. For example, the FCA and ESMA have both underscored that Big Tech ecosystems enable data integration across services like Google Search, YouTube, and Google Pay, potentially gaining an advantage over PSPs. These practices were cited by respondents as offering Big Tech firms the ability to personalize their services.

The act ensures that gatekeepers cannot exploit their vast data reserves to undermine contestability or entrench their market power. Furthermore, it aligns with concerns highlighted in stakeholder consultations about how unrestricted data integration across ecosystems limits the ability of smaller providers to innovate and compete effectively, thereby safeguarding consumer choice and fostering fair competition in the financial services market.

*Source: Project Team*

**4.3.2.3. Preferential Treatment of Proprietary Payment Solutions**

Big Tech companies have utilized their strong positions in non-financial markets to enter the online payment market. This cross-market leverage enables them to bundle services and create ecosystems that might be difficult for competitors to compete with. For instance, Apple not only offers Apple Pay but also bundles it with its hardware, such as the iPhone and Apple Watch, creating a deeply integrated value proposition for consumers who are already invested in the Apple ecosystem. Similarly, Amazon integrates Amazon Pay with its vast e-commerce platform, offering customers a convenient payment option that is deeply linked to their shopping activities.

Moreover, a potential anticompetitive concern may arise when Big Techs leverage their position in other services to ensure a more favourable display to their payment solution on both their own platforms and third-party online shops. Big Techs' entrenched position in other services such as social media platforms and app stores may allow them to give preferential treatment in terms of more favourable display options to their own payment solutions to the detriment of competitors. This may happen both on their own platforms and on third-parties online stores, since Big Techs may be able to leverage their large user base to obtain more favourable arrangements in terms of display options.

#### 4.3.2.3.1. Display Practices

The experimental evidence illustrated in section 2.3.2.1.1 suggests that display practices may significantly affect the choices consumers make in online purchases. Big Techs may indeed be able to exert influence over the availability and visibility of payment options on their platform. Below we describe indications from stakeholder interviews showing that Big Techs may rely on preferential display practices. To the extent to which they can leverage their entrenched positions and large user bases in other services to obtain a preferential treatment and therefore reinforce their position in the online payment sector, these practices could potentially create barriers for competitors and distort consumer choices.

As discussed in section 2.3.1.1.2, a key factor in this process is the way APIs are designed and implemented. APIs play a crucial role in determining which payment options are displayed to consumers. By detecting the user's device or operating system, they can trigger the display of a specific payment method (e.g. Apple Pay on iOS), even if it has not been actively selected or even owned by the user. Payment providers also often embed display practices within their APIs that shape the visibility of payment options.

Beyond API-driven mechanisms, Big Techs may also rely on specific display practices to reinforce their position in the online payments sector. These practices include defaulting, upstream integration, and the use of “show-more” banners to promote proprietary payment methods or those of selected partners. Merchant and provider consultations reveal the existence of preferential display practices favouring Big Tech payment solutions in both their own platforms/devices and third-party online shops. Stakeholders suggest that such practices may stem from contractual arrangements between Big Tech firms and merchants or result from platform-imposed restrictions (i.e. through the implementation of APIs). A significant proportion (54.5%) of payment applications providers identified competitors’ preferential display practices as key barriers to expanding or entering the online payment market. Five out of thirteen highlighted restrictions that, while not impeding their presence on Big Tech platforms, adversely affected the visibility of their payment applications.

Four providers of payment applications reported visibility limitations on Apple’s platforms. Two of them raised similar concerns about Amazon, and one about both Google and Samsung. According to the first four, Apple Pay benefits from defaulting on Apple’s platforms, while two highlighted the use of upstreaming and show more display practices. The behavioural experiment detailed in section 2.3.1.1.2 confirms that Apple Pay is more prominent on iOS (i.e. appeared higher in the list of available payment options) compared to Android devices<sup>341</sup>. Similarly, Google Pay is most frequently associated with Windows devices, suggesting that Big Tech’s digital wallets are more commonly offered in their native ecosystem. Finally, two payment application providers reported similar concern for Amazon.

From the merchant side, a large merchant acknowledged favouring Apple Pay and Google Pay through upstreaming and defaulting on their respective apps and websites, reflecting the influence of display practices on merchant behaviour and customer payment choices.

Another large European merchant reported having clauses or conditions concerning the display of Apple Pay in the contractual arrangements they have with the providers managing their online transactions (i.e. Chase, Adyen and Worldpay). Furthermore, while

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<sup>341</sup> Apple Pay is not available on Android for making purchases. However, the Apple Pay logo may still appear as a payment option when shopping online.

four out of five online merchant respondents stated that there are no restrictions on the choice or visibility of the payment methods they can offer to their customers on Big Techs' platforms, one respondent reported otherwise. Specifically, it noted that some payments methods that it generally accepts on their own website/app cannot run on those platforms due to restrictions imposed by the platforms themselves. Additionally, it added there are restrictions while not preventing its preferred payment methods from being used on Big Techs' platforms, do affect their visibility (e.g. display practices). More specifically, the online merchant reported that domestic credit and debit card schemes are subject to restrictions that affect their visibility (e.g. display practices) on Apple's platform. These restrictions, while not blocking functionality outright, reduced the visibility of these payment methods, effectively nudging consumers toward Big Tech solutions like Apple Pay. The merchant which reported to have contractual arrangements with Apple Pay confirmed that these contractual arrangements, through their providers managing their online transactions, included display conditions at checkout, which were imposed as mandatory terms rather than negotiated benefits. The mystery shopping exercise provided additional insights into the existence of display practices. Findings described in section 2.3.1.1.2 suggest that the visibility of certain payment options varies significantly depending on the operating system and device used. For example, Paypal was observed more frequently on Android and Windows devices than on Apple platforms. This aligns with the broader pattern of Apple leveraging its ecosystem to influence the prominence of its payment method, thereby shaping consumer behaviour.

The evidence discussed above suggests that display practices may alter consumer choice of the payment method used at checkout. However, the overall effect on competition depends on the extent to which stakeholders use such practice. As examined in section 2.3.2.1.1, upstreaming, defaulting and show-more banner display practices affect the choice made by consumers when choosing the payment method at checkout. However, the extent of their impact on consumer choice varies across practices. On the basis of the experiment carried out, presented in section 2.2.5, and independently of the payment methods favoured by the treatment (i.e. the display practice), show-more technique is the most effective in changing the payment method used by consumers from the one they prefer (80% of participants selected one of the proposed payment options without clicking the "show-more" button), followed by defaulting (22% of participants in the default treatment group did not change the preselected payment option at check-out) and upstreaming (15% of participants selected the "upstreamed" payment option, i.e. the option shown directly on the product page).<sup>342</sup> Through these display techniques, Big Tech companies, relatively new players of the online payment market compared to ICS or Paypal for instance, may be able to make consumers change their means of online payment from what they prefer to what is recommended by the display practice and in particular their own wallet, thereby encouraging their adoption.

The choice of payment options at check-out is not only influenced by the display practice itself but also by the payment options available on e-commerce platforms and the way these solutions are presented through the display practice. Consumers with a strong preference for a specific payment method may exhibit varying degrees of responsiveness to display practices. The experiment highlights that both the payment method selected in Task 1 (checkout page without display practice) and the suggested payment method by the display practice play a significant role in subsequent choices.

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<sup>342</sup> See Figure 2.48.

Notably and independently of the display practice, 43.6% of consumers who initially opted for Big Tech wallets in Task 1 maintained this preference in Task 2, where display practices were introduced. Among the remaining consumers, 19.4% transitioned to online banking solutions, 14.2% switched to credit or debit cards, and 11.7% shifted to Paypal (see Table 2.12).

An analysis of the effectiveness of different display practices reveals that Big Tech wallet users who own more than one wallet would be willing to use an alternative Big Tech wallet if prompted by the merchant. Specifically, when a different Big Tech wallet was suggested by the practices, these consumers changed their payment methods in 89.7% of cases when exposed to the Show More practice, in 32% of cases when exposed to Upstreaming, and in 24.4% of cases when exposed to Defaulting (see section 2.3.2.1.1).<sup>343</sup>

Excluding this specific circumstance, when examining Defaulting as a display practice, prompting consumers with Big Tech wallets primarily induces switching behavior among those who had initially selected Paypal (21.5%) or credit/debit cards (20.6%) (see Table 2.13). In the case of Upstreaming, suggesting Big Tech wallets leads to the highest rate of switching among consumers who initially chose "Other" payment methods (69.7%), followed by those who had previously selected Paypal (30.7%) and BNPL solutions (26.8%) (see Table 2.14). For Show More, the most substantial switching behavior is observed among consumers who initially selected other digital wallets (83.6%), BNPL solutions (80.4%), and Paypal (77.2%) (see Table 2.15).

Conversely, consumers who originally chose Big Tech wallets in Task 1 exhibit a higher likelihood of switching to alternative digital wallets when these are suggested via Defaulting (see Table 2.13), and to Paypal when it is promoted through Upstreaming (see Table 2.14) or Show More (see Table 2.15) (35.9% and 91.4%, respectively).

The results indicate that display practices play a role in shaping consumer decisions between Big Tech wallets, other digital wallets, and Paypal, suggesting a potential level of substitutability among these payment methods based on how they are presented at checkout.

#### **4.3.2.3.2. Bundling Practices**

A related practice is bundling, whereby Big Techs may exploit consumer preferences for services in which they have strong market positions to boost their payment solutions. In the context of digital payments, Big Tech firms may use their dominance in areas such as operating systems, online advertising, or app distribution to encourage or require the adoption of their proprietary payment solutions. This may alter competition by creating advantages for Big Tech wallets by reducing the visibility and attractiveness of rival payment methods, potentially limiting consumer choice. Moreover, bundling can be used to compel other payment service providers to integrate with or rely on Big Tech's infrastructure if they wish to remain available on these platforms, further reinforcing Big Tech's influence over the digital payments ecosystem and creating dependency.

During an interview, a domestic e-retailer association reported that "since Alphabet owns Google, and offers online advertisement services to companies, one potential risk could be that the company would offer merchants certain conditions for the provision of advertising services conditional to the adoption of Google Pay. This is however a hypothetical worry

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<sup>343</sup> However, the scope of implementing such display practices for a Big Tech may be limited by the unavailability of their wallet on rival Big Techs' devices or platforms (e.g., the unavailability of Apple Pay app on Android devices).

and the association merely keeps a close eye on the developments". Additionally, the Competition Commission of India (CCI) case against Alphabet in 2020 revealed that Google practices, in addition to granting the service prominent placement on the Play Store, Android operating system, and Android-based smartphones, manipulating search results and advertising algorithms on the Play Store to advantage Google Pay, included pre-installing and prominently positioning Google Pay during the initial setup of Android devices. Such actions were claimed to create a "status-quo bias," disadvantaging rival payment methods, such as UPI-enabled apps, mobile wallets, and net banking services. It was found that Google Pay has been integrated with intent flow methodology whereas other UPI apps can be used through collect flow methodology. It was noted that the intent flow technology is superior and user friendly than collect flow technology, with intent flow offering significant advantages to both customers and merchants (e.g. no need to handle push or SMS notifications, no need to switch between applications to complete a payment (merchant, SMS, and app) and no need to remember their Virtual Payment Address (VPA)) and the success rate with the intent flow methodology being higher due to lower latency. Google has informed the Commission that it has recently changed its policy and has allowed rival UPI apps to be integrated with intent flow.

Further compounding these concerns, additional indication from our consultation suggests the existence of compulsory bundling practices by major Big Tech's platforms. One merchant identified the ability to purchase bundled services as a notable advantage for Google, suggesting that its main strength lies in its large ecosystem that encompasses a variety of different services. One payment application provider reported experiencing compulsory bundling with other platform services on Amazon. Similarly, a staged digital wallet provider stated that it faced compulsory bundling with other services on platforms operated by Apple, Google, and Samsung. However, the specific services involved in these bundling practices were not disclosed, leaving uncertainty about the full extent of the restrictions imposed. Finally, a domestic payment applications provider reported concerns regarding device manufacturers, emphasizing the importance of ensuring that third-party payment providers have access to the same configuration capabilities that manufacturers grant to their own pre-installed wallets on smartphones.

**Box 4.7: Big Tech companies' preferential treatment in the Digital Markets Act**

The DMA addresses the competitive concerns arising from Big Tech firms' preferential treatment of their proprietary payment solutions. Article 5(7) prohibits gatekeepers from requiring business or end users to use their payment or technical services as a condition for offering services on their platform.

Additionally, Article 6(4) mandates that gatekeepers must allow and enable third-party software applications, including payment services, to be installed and effectively used on their platforms. Gatekeepers must also permit users to set these applications as defaults if they choose to do so. This provision targets the visibility and functionality restrictions raised by PSPs and merchants, where Apple Pay and Amazon Pay were systematically prioritized through defaulting and upstream integration. For example, stakeholder feedback highlighted competitors faced visibility limitations on Apple platforms, while domestic payment methods encountered similar challenges.

The DMA's obligations align with findings that preferential practices—such as pre-installation, prominent positioning, or display constraints—create significant barriers for rivals, entrenching the market power of Big Tech firms in the payment ecosystem. These practices distort market dynamics, disadvantage competitors by limiting visibility and functionality, and restrict consumer choice.

*Source: Project Team*

## 4.4. The role of Paypal

### Key take-aways

- Paypal has held a leading position in the EEA for years. The stakeholder consultation suggests it is the most widely accepted payment application by merchants in the EEA, with a considerable portion of respondents regarding Paypal as a must-have; and the consumer survey that it has ownership rates comparable to international cards;
- The success of Paypal can be attributed to the fact that it was a first mover among digital wallets, thus benefitting from the structural features that characterize the online payment sector;
- In recent years, however, although it has continued to grow in absolute terms, it has begun losing relevance, potentially in favour of Big Tech wallets, particularly Apple Pay. Consumer survey results suggest that Paypal is used less frequently by its owners compared to some of its main competitors, such as cards and Apple Pay;
- Nevertheless, it still preserves a relevant position, especially in countries such as Austria, Germany, Italy and Spain. In these countries, Paypal may hold some degree of market power which suggests that, should it implement practices aimed at maintaining its market position, these may raise competitive concerns.

Alongside ICS, banks, and Big Tech companies, Paypal has been a successful player in the payments landscape for years. Evidence from the stakeholder consultation indicates that Paypal is the most widely accepted payment application and is viewed as an essential payment method by the online merchants responding to the questionnaire, comparable to international cards. Notably, 14 out of 17<sup>344</sup> merchants considered Paypal a "must-have" payment method for their browser, app, or both. 82.35% of merchants surveyed offer the possibility to pay with Paypal on their website.

Capgemini data suggest Paypal captures significant shares of e-commerce transactions in Europe, and among the countries examined in the study, particularly in Austria, Germany, Italy, Spain (see Figure 4.11 below). The results of the consumer survey confirm Paypal's popularity among consumers in the EEA: 65% of respondents reported they own Paypal – a share comparable to that of cards; and this share is relatively higher in Austria, Germany, Italy and Spain.<sup>345</sup> Importantly, most of the countries where Paypal has the highest shares of e-commerce transactions are among the countries with the higher e-commerce values in the sample of 14 selected countries (notably, France, Germany, Italy and Spain).

The share of Paypal's transactions in other countries such as Denmark, the Netherlands, Poland and Sweden is lower: the presence of widely used A2A payment solutions in these countries may contribute to this result.<sup>346</sup> An association of merchants noted that in the Netherlands Paypal is mainly accepted by merchants who engage in cross-border sales,

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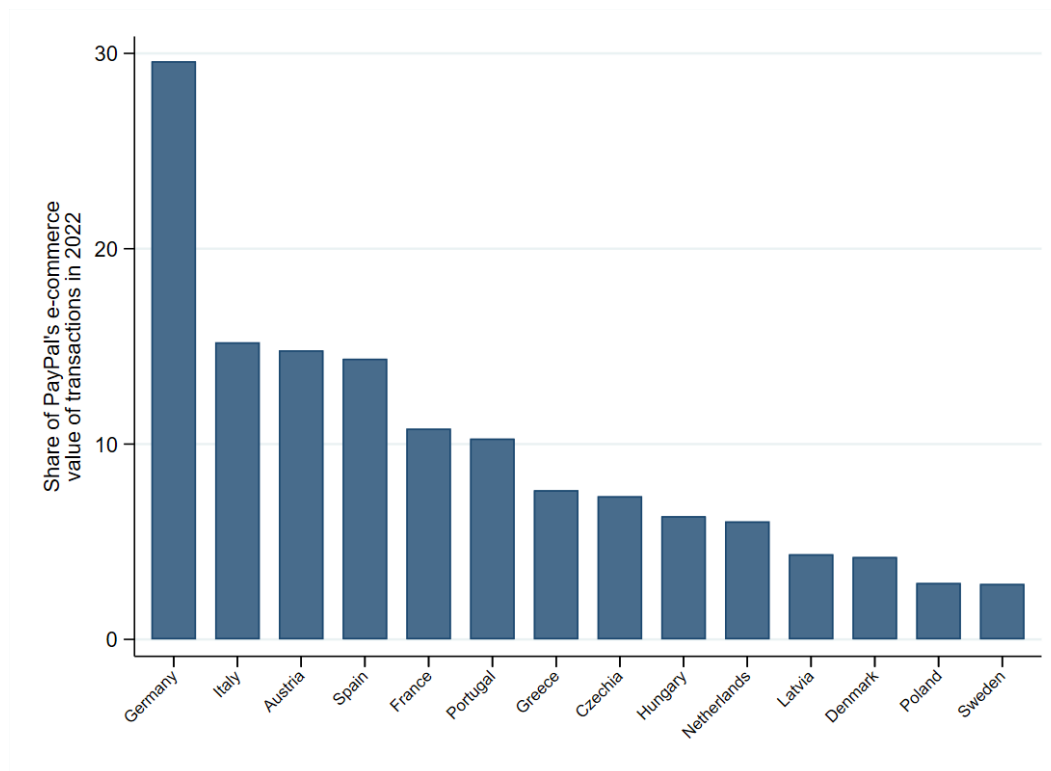
<sup>344</sup> The other three merchants participating in the consultation did not reply to this specific question.

<sup>345</sup> 72%, 88%, 77% and 77%, respectively.

<sup>346</sup> Mobile Pay, iDEAL, Blik and Swish, respectively.

especially those directed towards countries in which Paypal is widely used by consumers (e.g. Italy).

**Figure 4.11: Paypal's shares of e-commerce value of transaction in 2022 – country level**



Source: Based on Capgemini data

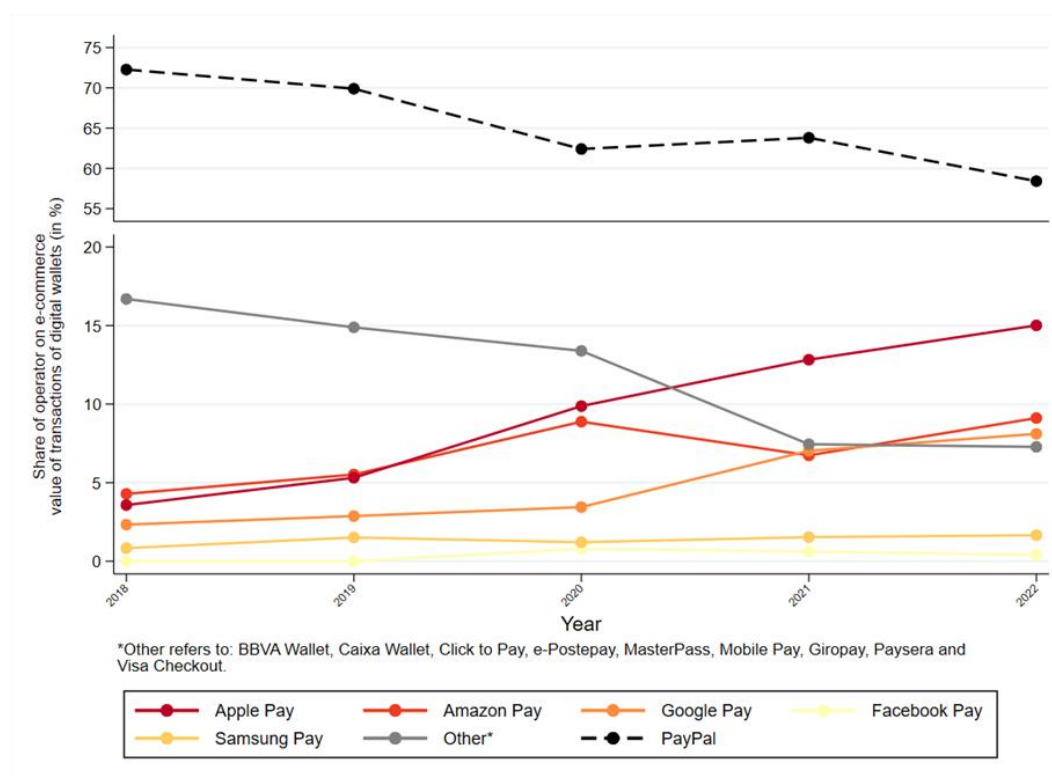
Paypal has managed to preserve its relevant position, despite the entry of new payment methods, such as Big Techs wallets and A2A. The success of Paypal can be attributed to multiple factors:

- Paypal has been a first mover, entering the online payment market in 2004 in Europe and gaining rapid popularity as a payment method, also thanks to the acquisition by the e-commerce platform eBay. Soon after, it developed a P2P functionality, which contributed to an increase in its user base;
- as an established player in the online payment market, Paypal is widely regarded as trustworthy and secure. This perception, combined with consumer inertia, likely encouraged users to stick with Paypal—at least for some time—despite the entry of new competitors;
- Paypal is one of the few digital staged wallets (thereby meaning its wallet functions in two main stages). In the first stage (funding stage), consumers top up the wallet, and can transfer funds from bank accounts, credit cards and debit cards. Paypal has an incentive to steer consumers towards funding via banks accounts, which entail lower costs than those typically associated with cards (particularly ICS) and may thus allow Paypal to reduce its merchant commission rates. This strategy could have

contributed to Paypal's early success.<sup>347</sup> The recent DOJ complaint reports a statement by one of Visa executive's assessment according to which "the only major entity to successfully disintermediate Visa in the United States is Paypal". However, the agreement between Visa and Paypal – as documented in the DOJ complaint<sup>348</sup> – envisaging, *inter alia*, debit routing commitment of 100% of Visa-eligible transactions over Visa's network might have softened this incentive.

In recent years, however, Paypal has begun losing relevance, potentially in favour of Big Tech wallets, particularly Apple Pay (see Figure 4.12).

**Figure 4.12: Evolution of shares of e-commerce value of transaction of digital wallets - selected countries**



Source: Based on Capgemini data

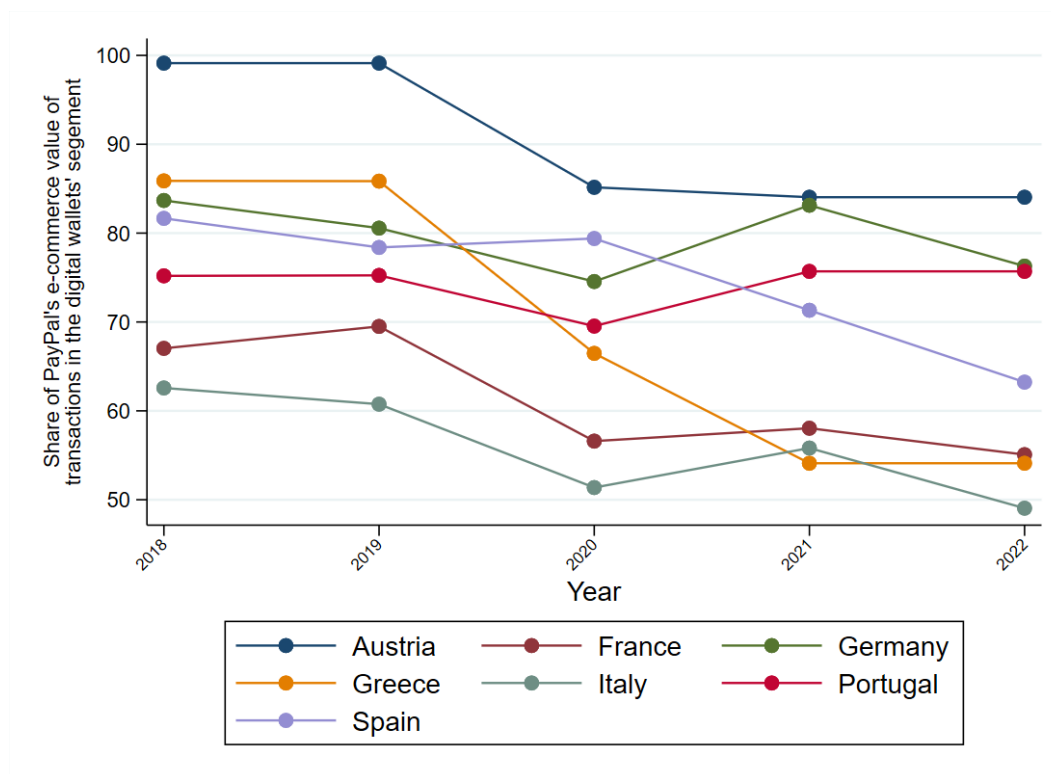
Paypal has witnessed a relevant decline in its share in the digital wallet segment, from more than 70% in 2018 to less than 60% in 2022. This sharp decrease contrasts with the growing share of competitors like Apple Pay, whose share increases from 4% to 15% during the same period, Google Pay which goes from around 3% to around 8% in 2022 or Amazon Pay which goes from around 4% to around 9% in 2022. In contrast, Facebook Pay and Samsung Pay maintain relatively low and stable shares throughout the period.

<sup>347</sup> During an interview with the Project Team, a digital wallet provider competing with Paypal noted that through this strategy Paypal was able to improve its margins. The extent to which lower costs were passed on to merchants is not clear.

<sup>348</sup> See section 4.1.2.

Similar patterns of decrease are evident across the countries examined in the study. Figure 4.13 below shows the evolution of Paypal's share of e-commerce values of transactions through digital wallets in the period 2018-2022 in individual countries, focusing on the countries where Paypal has the highest shares of overall e-commerce transactions in 2022.<sup>349</sup>

**Figure 4.13: Evolution of Paypal shares of e-commerce value of transaction of digital wallets -selected countries**



Source: Based on Capgemini data. Data on digital wallets are limited to the following players: Apple Pay, Google Pay, MasterPass, Samsung Pay, BBVA Wallet, Giropay, MobilePay, Facebook Pay, Click to Pay, Paypal, Amazon Pay, Visa Checkout, Caixa Wallet, e-Postepay and Postepay.

The observed decline of Paypal can be explained by several reasons:

- customers increasingly value seamless and privacy-conscious checkout experiences, areas where Paypal's identity verification requirements and complex account creation processes can detract from these expectations, making it less appealing;
- in 2018, eBay decided to move its payment operations from Paypal to Adyen. By intermediating payments directly on its platform, eBay aimed to meet modern shopper expectations for seamless transactions, aligning with competitors like Apple Pay and Google Pay. This transition may have eroded consumer trust in Paypal and underscored a broader trend: online merchants and platforms increasingly prefer integrated payment solutions that emphasize simplicity and cost-effectiveness;

<sup>349</sup> See Figure 4.11.

- Big Tech players have challenged Paypal position, benefiting from strong network effects, access to large and captive user bases, and the ability to leverage big data and advanced technologies;
- Paypal remains largely confined to online markets. In contrast, several mobile payment applications have emerged that can be used by consumers for offline retail purchases through mobile devices. Given that consumers value convenience a lot, this innovative feature has likely boosted demand for such mobile payment applications, allowing them to reach consumers that did not previously use wallets. This leverage may have been particularly effective for the Big Tech wallets, such as Apple Pay and Google Pay, which are integrated in Apple's and Google's mobile devices and utilize NFC technology that enables contactless payments. As mentioned in chapter 3, there are spillover effects from the offline payment sector. This has further contributed to the above finding that Paypal has been losing share of e-commerce transactions though digital wallets to the benefit of the Big Techs;
- the emergence of new innovative payment methods such as A2A payment solutions and BNPL may have put further competitive pressure on Paypal, even if the degree of substitutability among digital wallets and these services may be imperfect. For example, to keep up with the evolution in consumer demand, Paypal introduced a BNPL functionality.

Nevertheless, according to Capgemini data, Paypal's share of digital wallet transaction values remains above 50% in Austria, France, Germany, Greece, Italy, Portugal and Spain, despite this downward trend.

In these countries, Paypal is likely to have a certain degree of superior bargaining power *vis-à-vis* merchants,<sup>350</sup> considering the evidence that most merchants participating to the consultation regarded it as a must-have payment method. Paypal's high acceptance rates among merchants, although its costs are relatively higher than those of the other main payment methods in several MS, supports this conclusion.

In this context, Paypal might have engaged in practices aimed at preserving their position in the online payment market. On 23 January 2023, the Bundeskartellamt initiated proceedings against Paypal, investigating potential anti-competitive conduct, particularly the company's "Rules about surcharging" and the "Presentation of Paypal" included in its user agreement applicable in Germany. These rules prohibit merchants from offering lower prices when customers choose cheaper payment methods or from expressing a preference for alternatives to Paypal. Such restrictions may limit price competition and hinder the ability of competing or emerging payment services to enter or expand in the market, ultimately leading to higher costs for consumers.<sup>351</sup>

The stakeholder consultation raises some concerns that Paypal may manage to obtain a more favourable display:

- Two merchants responding to the questionnaire reported that they implement display practices that favour Paypal. One of them said Paypal benefits from both defaulting and show more banner; another one said Paypal benefits from both

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<sup>350</sup> Paypal directly contracts with merchants (see section 1.4).

<sup>351</sup> Bundeskartellamt. 2023. Bundeskartellamt initiates proceeding against Paypal. [https://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2023/23\\_01\\_2023\\_Paypal.html](https://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2023/23_01_2023_Paypal.html)

upstreaming and show more banner. One of these two merchants noted they obtained better contractual conditions thanks to this arrangement;

- One provider of payment applications indicated that competing payment methods including Paypal are defaulted in merchants' checkout pages and this represents an obstacle for them to expand their offer.

As already discussed in section 4.1, the results of the consumer survey and behavioural experiment suggest that display practices may be able to alter consumer choice of payment methods. In particular, Paypal is the payment method, together with cards and the Big Techs' wallets, that is associated with the highest rates of switching when favoured by a display practice, compared to other payment methods. For upstreaming, in particular, digital wallets (including Paypal and the Big Techs) seem to be the most effective at eliciting the most switching.

The extent to which these practices can distort competitive dynamics depends on whether they are the result of an exercise of market power and on the extent of such market power. This, in turn, depends on Paypal's "must-have" status, which may vary across countries and is more likely in markets where Paypal holds a higher share of online transactions.

## A. Annex A

Annex A includes the design of the country selection criteria for the study.

The design of the country selection criteria for the study has been driven by the following objectives:

- establishing a logical basis on multiple criteria for determining the EEA (European Economic Area) countries to be analysed;
- capturing the diversity of population and cultures across Europe – thus ensuring the validity and generalizability of the evidence found – for the purpose of the survey presented in Chapter 1;
- extracting a comprehensive group of Member States to best represent the situation in the EEA by accounting for geographical variations that may be associated with economic or cultural traits, different online payment adoption levels, and the existence of perceived obstacles in the way of online consumer decisions, ultimately contributing to a more robust and representative study;
- in addition to the statistical evidence, considering countries with specific relevant measures that could prove interesting over the course of the study. For example, the inclusion of Greece in the sample is further motivated by its remarkable and rapid transition from cash to card-based payments during the Covid-19 pandemic.<sup>352</sup> This shift, along with government regulations (e.g., Euro 500 threshold for cash transactions), presents a unique case for understanding the impact of environmental factors on payments behaviour.

For this purpose, we identified the following broad categories of selection criteria:

1. Demographic, geographic and economic criteria
  - a. Geographical coverage. In order to offer sufficient coverage of the different geographical regions of the EU, we have opted for a selection of 14 countries representing all the different sub-regions of the Union (as per Eurovoc's classification<sup>353</sup>). We thus have four Nordics (Sweden, Denmark, and Latvia), four Western (Germany, France, Austria and the Netherlands), four Southern Member States (Spain, Italy, Portugal and Greece) and three Central and Eastern European countries (Hungary, Czechia and Poland).
  - b. Size of the country's population.<sup>354</sup> The selection of countries proposed covers 85% of the population of the Union. Which means that the findings of this study will be directly applicable to markets covering four Europeans out of five. Our selection covers all country sizes, including the countries with the highest population in the Union, medium-sized countries, and countries with a small population.
  - c. Economic variation. This criterion ensures that selection includes countries with varying economic strengths, as measured by GDP per capita. This variation in economics is important for understanding how online payment methods are adopted across different economic contexts. For example, countries with strong

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<sup>352</sup> Kantar Public. (2022) "Study on New Digital Payment Methods."

<sup>353</sup> Eurovoc (2023) [https://eur-lex.europa.eu/browse/eurovoc.html?params=72,7206#arrow\\_7206](https://eur-lex.europa.eu/browse/eurovoc.html?params=72,7206#arrow_7206).

<sup>354</sup> Eurostat (2022) [https://ec.europa.eu/eurostat/databrowser/view/DEMO\\_PJAN\\_\\_custom\\_7454090/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/DEMO_PJAN__custom_7454090/default/table?lang=en).

economies like Germany and France are included, but so are countries with lower GDP per capita like Portugal.

2. Criterion capturing the adoption rate of online payments

- a. Internet purchases.<sup>355</sup> The percentage of online transactions during 2022 is a fundamental variable to consider because it reflects the level of digitalization and e-commerce adoption in each country. This variable is essential for understanding the current state of online financial transactions, which is increasingly shaping the global economy. Countries with high online payment adoption may have different security concerns and behaviour compared to those with lower adoption rates, making it a critical factor to consider. Past experience, which plays a pivotal role in influencing purchasing behaviour, is closely intertwined with this variable. In countries with a long history of extensive online transactions, consumers might have developed habits and preferences that prioritise certain payment methods over others due to their positive past encounters. Conversely, in regions with nascent online payment adoption, consumers' limited exposure to various methods can lead to different decision-making factors.

3. Behavioural criterion

- a. Index of perceived barriers to buying/ordering on the Internet.<sup>356</sup> Examining barriers to online purchases is crucial because different countries may have varying obstacles, such as skills gaps, limited payment options, trust issues, and security concerns. Our index does not directly represent the percentage of people not purchasing online; instead, it serves as an indicator of the presence of these barriers. It combines various variables to provide a score that highlights the degree of these obstacles, helping us to identify regions within the EU where we can gain valuable insights into online payment behaviour.

The above criteria led to the following country selection: Austria, Czechia, Denmark, France, Germany, Hungary, Greece, Italy, Latvia, Netherlands, Poland, Portugal, Spain, Sweden.

The tables below show the factors that we considered for our selection.

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<sup>355</sup> Eurostat (2022) [https://ec.europa.eu/eurostat/databrowser/view/isoc\\_ec\\_ib20/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/isoc_ec_ib20/default/table?lang=en).

<sup>356</sup> Eurostat (2019) [https://ec.europa.eu/eurostat/databrowser/view/ISOC\\_EC\\_INB/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/ISOC_EC_INB/default/table?lang=en).

Table A.1: Full table indicators

Country	Mandatory countries	Internet purchases per capita (Eurostat, 2022)	Internet purchases per capita (Eurostat, 2022)	Geographical representation	Population size (Eurostat, 2022)	Population as a percentage of EU27 population (Eurostat, 2022)	Barriers index (based on Eurostat, 2019)	Barriers index level (based on Eurostat 2019)
BG		Very low	24	Central-East	Low	1,4%	Medium	5,6
RO		Very low	27	Central-East	Medium	4,2%	Medium	6,0
CY		Low	34	South	Low	0,2%	High	20,3
IT	X	Low	37	South	High	13,1%	Medium	5,2
LV	X	Medium	42	North	Low	0,4%	Medium	3,8
PT		Medium	43	South	Medium	2,3%	High	21,5
HR		Medium	44	Central-East	Low	0,9%	Medium	5,2
LT		Medium	46	North	Low	0,6%	Medium	7,6
EL		Medium	46	South	Medium	2,3%	Medium	7,3
SI		Medium	50	Central-East	Low	0,5%	Medium	4,0
PL	X	Medium	51	Central-East	High	8,2%	Low	2,1
ES	X	Medium	55	South	High	10,7%	High	14,0
EU 27		-	56	-	-	100%	-	5,7
AT		Medium	57	West	Medium	2,0%	Medium	6,4
EE		Medium	59	Central-East	Low	0,3%	Low	1,3
MT		Medium	59	South	Low	0,1%	Medium	8,3
HU		High	61	Central-East	Medium	2,1%	High	14,6
FI		High	63	North	Low	1,2%	High	9,2
BE		High	63	West	Medium	2,6%	Medium	3,7
FR	X	High	63	West	High	15,2%	Medium	4,4
SK		High	65	Central-East	Low	1,2%	Medium	4,1
CZ		High	66	Central-East	Medium	2,4%	Low	2,4
DE	X	High	66	West	High	18,8%	Low	3,2
LU		High	70	West	Low	0,1%	Low	3,1
SE	X	Very High	76	North	Medium	2,3%	Low	3,0
IE		Very high	77	West	Low	1,2%	Low	3,0
DK	X	Very high	78	North	Low	1,3%	Low	1,3
NL		Very high	79	West	Medium	4,0%	Low	2,8

Source: Project Team

**Table A.2: Barriers to online payment index indicators**

Country	Barrier: IT skills (%)	Barrier: Lack of payment card (%)	Barrier: Trust concerns (%)	Barrier: Security concerns (%)	Barriers index level (%) (based on Eurostat,2019)	Barriers index (based on Eurostat,2019)
Denmark	0,61	0,36	1,77	2,51	1,3	Low
Estonia	2,90	0,34	0,99	1,08	1,3	Low
Poland	3,44	0,90	2,05	2,06	2,1	Low
Czechia	3,43	1,15	2,38	2,64	2,4	Low
Netherlands	3,22	1,23	2,92	3,73	2,8	Low
Sweden	3,24	0,93	2,39	5,27	3,0	Low
Ireland	4,57	2,25	0,85	4,45	3,0	Low
Luxembourg	4,01	3,62	1,63	3,14	3,1	Low
Germany	3,56	2,80	2,55	3,89	3,2	Low
Belgium	3,92	3,30	2,49	4,92	3,7	Low
Latvia	4,98	1,45	3,75	5,21	3,8	Low
Slovenia	4,09	3,35	2,22	6,20	4,0	Low
Slovakia	5,09	1,69	4,37	5,36	4,1	Low
France	3,83	1,32	3,22	9,23	4,4	Low
Croatia	4,16	1,03	3,10	12,45	5,2	Medium
Italy	5,35	6,45	4,80	4,17	5,2	Medium
Bulgaria	7,70	3,66	6,14	4,78	5,6	Medium
EU27	6,36	3,78	5,35	7,44	5,7	Medium
Romania	9,15	6,21	4,58	4,03	6,0	Medium
Austria	7,00	4,42	4,93	9,20	6,4	Medium
Greece	9,68	3,50	4,71	11,40	7,3	Medium
Lithuania	11,14	3,95	9,43	5,68	7,6	Medium
Malta	14,44	4,13	6,90	7,57	8,3	Medium
Finland	7,78	2,90	10,99	15,07	9,2	High
Spain	15,92	7,75	14,74	17,48	14,0	High
Hungary	14,40	11,52	15,25	17,14	14,6	High
Cyprus	23,76	30,46	13,27	13,79	20,3	High
Portugal	21,01	9,99	25,12	29,94	21,5	High

Source: Project Team

Table A.3: Country selection against all criteria used for sample selection

	Country	Mandatory countries	Geographical representation	Population size (Eurostat,2022)	Population as a percentage of EU27 population (Eurostat,2022)	Internet purchases per capita (Eurostat, 2022)	Internet purchases per capita (Eurostat, 2022)	Barriers index level (based on Eurostat,2019)	Barriers index (based on Eurostat,2019)
Selected countries	CZ		Central-East	Medium	2,4%	High	66	Low	2,4
	AT		West	Medium	2,0%	Medium	57	Medium	6,4
	IT	X	South	High	13,1%	Low	37	Medium	5,2
	LV	X	North	Low	0,4%	Medium	42	Medium	3,8
	PT		South	Medium	2,3%	Medium	43	High	21,5
	FR	X	West	High	15,2%	High	63	Medium	4,4
	SE	X	North	Medium	2,3%	Very High	76	Low	3,0
	DK	X	North	Low	1,3%	Very high	78	Low	1,3
	EL		South	Medium	2,3%	Medium	46	Medium	7,3
	DE	X	West	High	18,8%	High	66	Low	3,2
	PL	X	Central-East	High	8,2%	Medium	51	Low	2,1
	ES	X	South	High	10,7%	Medium	55	High	14,0
	HU		Central-East	Medium	2,1%	High	61	High	14,6
	NL		West	Medium	4,0%	Very high	79	Low	2,8
Non selected countries	EU 27		-	-	100%	-	56	-	5,7
	EE		Central-East	Low	0,3%	Medium	59	Low	1,3
	MT		South	Low	0,1%	Medium	59	Medium	8,3
	BE (reserve)		West	Medium	2,6%	High	63	Medium	3,7
	SI		Central-East	Low	0,5%	Medium	50	Medium	4,0
	SK		Central-East	Low	1,2%	High	65	Medium	4,1
	BG		Central-East	Low	1,4%	Very low	24	Medium	5,6
	LT		North	Low	0,6%	Medium	46	Medium	7,6
	HR		Central-East	Low	0,9%	Medium	44	Medium	5,2
	LU		West	Low	0,1%	High	70	Low	3,1
	RO		Central-East	Medium	4,2%	Very low	27	Medium	6,0
	IE (reserve)		West	Low	1,2%	Very high	77	Low	3,0
	CY		South	Low	0,2%	Low	34	High	20,3
	FI		North	Low	1,2%	High	63	High	9,2

Source: Project Team

## B. Annex B

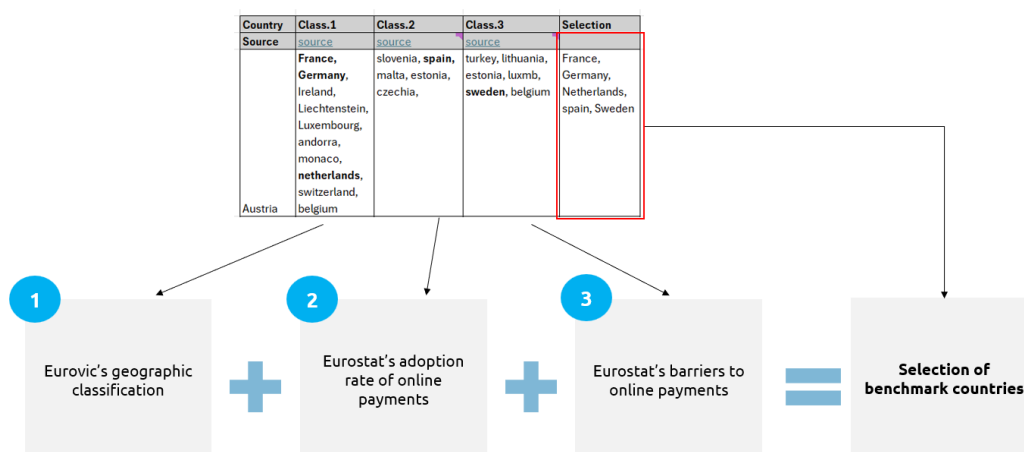
Annex B includes the methodology used to close data gaps based on existing data, as used in chapter 1 Table 1.14.

To ensure comprehensive data management and quality assessment for each deliverable, an Excel tracker is implemented. This tracker monitors data gaps, categorizing the availability of data as either fully available, partially available, or missing. For each deliverable, a detailed list is compiled of all sources that have been scanned. Each source is evaluated and annotated regarding its quality, indicating whether it is of good or dubious quality. As a parameter for the qualitative assessment a distinction is made between sources of (1) financial institutions (e.g. ECB & National Banks) and (2) regulatory authorities (e.g. EU Commission) as well as (3) databases (e.g. ECB Statistical Data warehouse Statista, EuroStat). This process is systematically applied to every selected EEA country, ensuring that our data collection and analysis are both thorough and reliable.

In instances where data is missing or only available from questionable sources, a methodology is developed for estimating the required data based on other available information. The prerequisite for the methodology is that the data for a set of countries must already be available. The methodology comprises a number of stages which can be modified depending on the nature of the data.

In step 1, proxy countries are identified through a classification process. The identification of countries is based on three distinct classifications. First, the Eurovic geographic classification is employed. Second, the adoption rate of online payments as reported by Eurostat is considered. Third, the behaviour of the relevant population will be examined. In this case, Eurostat provides data on the barriers to online payments. All countries that fall into one or more of the above categories and are part of the EEA are identified. The number of proxy countries selected is contingent upon the availability of their data.

**Figure B.1: Example of step 1 of data gap methodology**



Source: own methodology

In step 2, a balanced scorecard is created in order to determine the percentage that a proxy country should count for. The scorecard comprises five dimensions. First, the cultural similarity will be calculated based on the dimensions proposed by Hofstede. Second, the similarity of payment options is considered. Third, the barriers index level is evaluated, which measures the difficulty individuals experience when ordering or

**Figure B.2: Example of step 2 of data gap methodology**

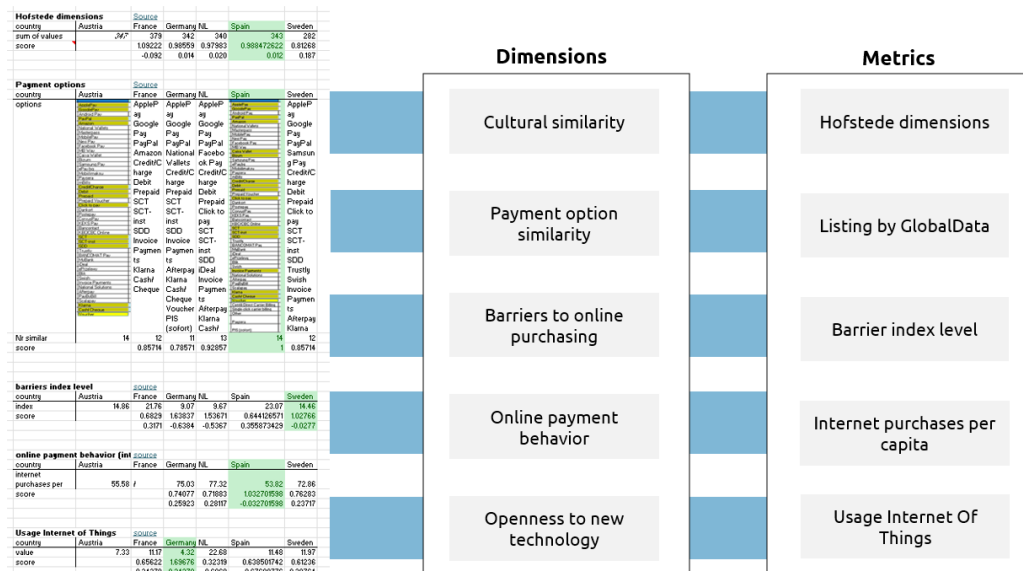


Figure B.3: Example of step 3 of data gap methodology

**Austria**

Criteria	Benchmark	Score	Final
<b>culture</b>	Spain	10	0.217391
<b>similarity of payment options</b>	Spain	10	0.217391
<b>barrier index</b>	Sweden	10	0.217391
<b>internet purchases per capita</b>	Spain	10	0.217391
<b>Internet of things use</b>	Germany	6	0.130435
<b>Total</b>		46	1

<b>Spain</b>	65.22%
<b>Sweden</b>	21.74%
<b>Germany</b>	13.04%
	100.00%

Source: own methodology

In step 4, an estimation will be made of the required data based on the proxy countries' available data, considering the country similarity and their weight. To illustrate, the split between in-app and browser payments for Austria is missing, the estimation of this data is based on the following proportions: 65.22% of the data from Spain, 21.74% of the data from Sweden and 13.04% from Germany.

## C. Annex C

Annex C includes the literature review of chapter 2.

Note: This literature review has been made with the intention to inform future data collection methods. The model will serve as blueprints for questionnaire design depicting where it should investigate and in how much depth.

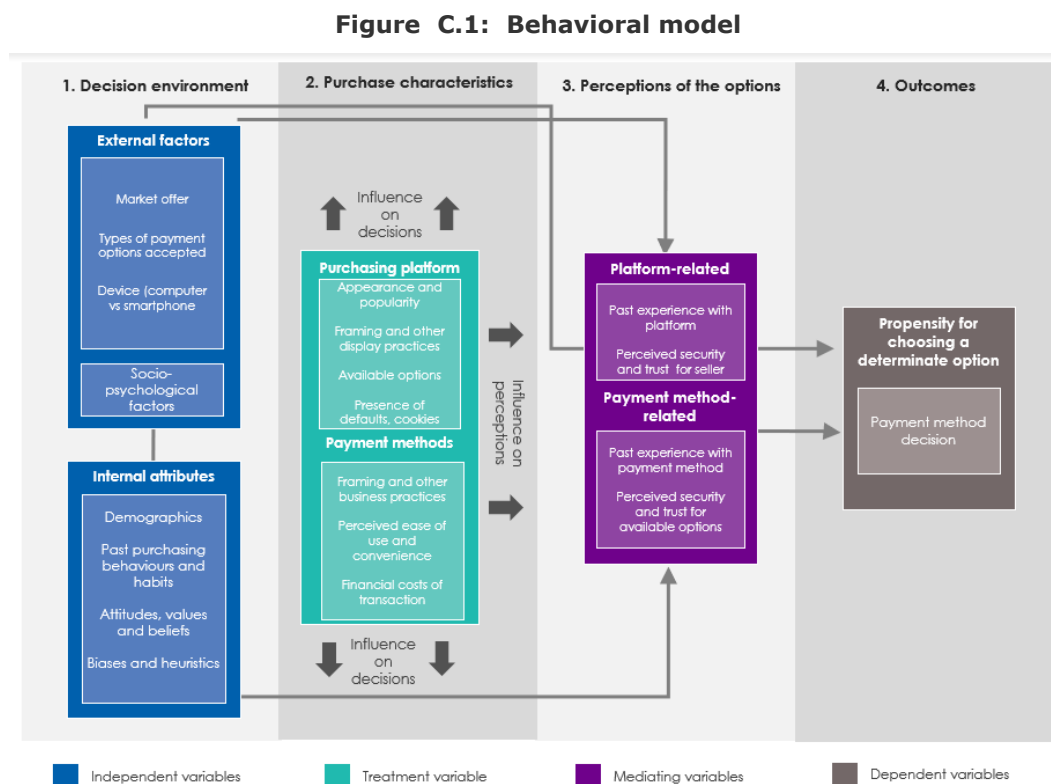
The current review does not contain all possible sources, it is not exhaustive as this would take far too much time and is not part of the project objectives. It however shows the areas where there are no current sources to be found and therefore where this study will be a pioneering. It is worth mentioning that literature gaps occur in many areas of the model.

The sections of the model that are written out are those where literature could be found. Those left out are areas where no literature was found. In some sections, links are made with other literature that could serve as bridges when no studies are found on the specific subject.

### C.1 The behavioural model

This behavioural model was developed based on the reviewed literature. As such, it provides a realistic and evidence-based framework for understanding the behavioural mechanisms behind digital payment method choice. The purpose of the model is to structure the interactions among variables to explain the behavioural mechanisms underlying the influencing factors.

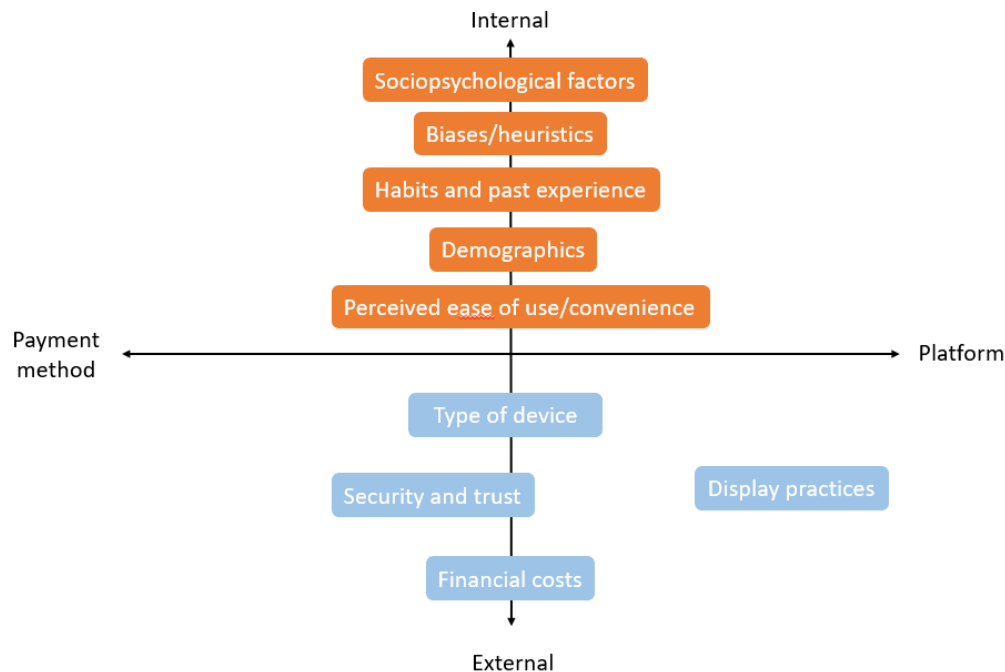
The figure below shows the structure and content of the model:



*Source: Project Team elaboration*

The outcomes of decisions are shaped by three key categories of factors: the decision environment, the characteristics of the purchasing environment, and individuals' perceptions of their available options. Each category contains one or more groups of factors, and each group in turn contains several factors and sub-factors. As shown in Figure C.2, the factors (variables) inscribed in each macro-factor have been organised on two axes. A first distinction was made according to whether they are determined internally or externally. Then, the variables categorised as external were divided according to whether they relate to the payment method or to the platform.

**Figure C.2: Factors that influence consumer behaviour towards payment solutions**



Source: Project Team elaboration

### C.1.1 Sub-groups within the behavioural model

The decision environment is formed by two groups of factors related to the context in which the decision to choose a payment method occurs. Here, an initial organisation of variables was made according to the internal/external logic. The first, 'availability', contains two sub-groups of external variables, related to market conditions and costs on the one hand, and to social norms on the other. The second group, 'individual attributes', features a series of variables that are intrinsic to the individual. It is important to note that, although the groups are distinct, their interaction concurs with shaping decision preferences.

The purchase characteristics comprehend one group of external variables. These were further divided into two sub-groups based respectively on the payment method and platform. Similarly, the influence of purchase characteristics on the dependent variable is a result of the interaction of both. It is important to note that the distinction between internal and external variables is without prejudice to the fact that certain external variables – for instance, business models and strategies – may lever on internal ones, such as heuristics and biases.

The perceptions of the available options relate to the consumer's perceived control over the purchase and are divided into two sub-groups according to the method/platform

logic. As shown in the model, perceptions are influenced by both internal and external factors.

The outcomes are consumers' final decisions with regard to the digital payment method.

### **C.1.2 Factors influencing consumer behaviour**

The literature review identified a broad set of internal and external factors influencing digital payment method choice. The first group relate to the individual making the choice, whereas external factors regard the specific features of the online platform where the purchase is being made, and/or to those of the e-payment method.

In total, the literature review led to the mapping of 5 internal and 4 external factors.

Internal factors are those related to the internal characteristics of the individual concurring to form the final decision. These characteristics shape choice in a twofold way, by (i) intrinsically shaping individuals' preferences and attitudes and (ii) being capitalised upon by marketing strategies (choice architecture).

External factors comprehend the characteristics – actual and perceived – of the payment methods and purchasing platforms. 'Actual' characteristics refer to financial costs, display practices and business models, whereas 'perceived' characteristics are perceived security and trust, as well as the framing of the choice impacting the perception of the available options.

Table C.1: Overview of internal and external factors

	Factor type	Sub-factor	
Internal	Sociopsychological factors		
	Habits and past experience		
	Heuristics and biases	Loss aversion	
		Risk aversion	
		Regret aversion	
		Descriptive social norms	
		Injunctive social norms	
		Overconfidence	
		Anchoring bias	
		Present bias	
		Status-quo bias	
	Perceived ease of use and convenience		
	Demographics		
External	Type of device		
	Perceived Security and trust		
	Financial costs		
	Display practices	Framing	Default setting
			Up-streaming
			Option up-front
			Accelerated single-item purchases
			Previously selected
			Primary payment option
		Categorising options	
			Information provision
			Sole payment option
			Pre-filled information
Logo display			
Offers/promotions/rewards			
Product recommendation			

Source: Project Team elaboration

## C.2 Dependent variable - Outcome

The dependent variable is the decision outcome of the consumer's choice of digital payment method.

The impact of the decision environment on outcomes operates in both direct and indirect ways. It directly affects decision outcomes, but this influence is also shaped by individuals' perceptions of the environment. On the other hand, purchase characteristics are not directly influenced by the decision environment but act as significant factors in how individuals perceive their options within that environment. Consequently, while decision outcomes are influenced by the decision environment, the perceptions individuals have about their options act as an intermediary. These perceptions mediate the relationship between the independent variables (decision environment) and the dependent variable (decision outcomes). Additionally, purchase characteristics play a moderating role between the independent and mediating variables, affecting how the decision environment influences individuals' perceptions.

### **C.3 Independent variables - Decision environment**

The independent variables are part of the decision environment, composed of external factors like external market conditions, - i.e. the types of accepted methods and the type of device the purchase is being made on – and sociopsychological factors, such as the perception and acceptance of the various options in the consumer's social sphere. On the other hand, individual attributes are intrinsic to the individual and shape consumers' preferences and perceptions about the available options. Based on the literature review, relevant individual attributes include (i) demographics, (ii) past behaviours and habits, (iii) attitudes, values, and beliefs, and (iv) cognitive heuristics and biases.

#### **C.3.1 External**

The type of device on which an online purchase is carried out can significantly influence decision outcomes. The differences in consumer experience deriving from the type of device used are key to understanding the impact of the considered variables on choice in depth. Therefore, this is a key variable to consider, as it provides the understanding necessary to differentiate e- and m-commerce market dynamics by helping to identify key factors that drive consumer choice within the different devices.

While the literature reviewed offers valuable insights into online payment behaviour, there exists a gap in specific comparison between app-based and browser-based purchases.

M-commerce and e-commerce are often seen as related yet distinct channels for online shopping. While some researchers view mobile shopping as an extension of online shopping<sup>357</sup>, others focus on delineating the differences between these two channels. M-commerce, characterized by anytime, anywhere transactions facilitated by mobile devices, offers unparalleled convenience but also presents challenges such as limited usability due to small screens and concerns about privacy and security<sup>358</sup>.

Consumer behaviour in m-commerce and e-commerce environments varies significantly, with studies highlighting differences in online engagement and cognitive effort. While browser sessions might show higher initial engagement metrics (e.g.

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<sup>357</sup> Ngai, E.W.T., Gunasekaran, A., 2007. A review for mobile commerce research and applications. *Decis. Support Syst.* 43, 3–15. <https://doi.org/10.1016/j.dss.2005.05.003>.

<sup>358</sup> Ipsos, 2015. Ipsos Study for Paypal Reveals Drivers and Barriers of Mobile Shopping around the World.

number of pages viewed, time spent), in-app sessions often reflect a deeper engagement during critical stages like product exploration and checkout<sup>359</sup>.

Mobile app usage tends to be more task-oriented, focusing on specific actions like making a purchase or checking order status. On the other hand, browser usage often involves more exploration-oriented behaviour, such as browsing multiple products or comparing prices across different websites<sup>360</sup>.

The cognitive effort required for tasks on apps versus browsers also differs. Mobile apps, designed for streamlined interactions and simplified interfaces, often reduce cognitive load during transactions, leading to smoother check-out experiences<sup>361</sup>. In contrast, browsers may require more navigation steps, potentially increasing decision fatigue and affecting purchase completion rates.

Consumers demonstrate varying levels of impulsiveness based on the device used. Smartphone users, in particular, tend to exhibit more impulsive buying behaviour. Specifically, consumers report weaker impulse control and are less willing to invest time in the decision-making process when using a smartphone. This may be attributed to the present bias, which was proven to have a stronger effect on decisions in the case of smartphone use. This decreases the will to delay gratification, resulting in impulsive decision-making<sup>362</sup>. Notably, there is also evidence of a correlation between smartphone addiction and the use of mobile wallet payment methods<sup>363</sup>. This invites speculation that e-wallets are more likely to be chosen when the purchase is made on a smartphone, compared to a computer.

Sociopsychological factors refer to the influence of social processes on consumers' behaviour. Prior research in social psychology has found that other people's behaviours, preferences, and experiences, together with social norms, are determinants of online payment method choice<sup>364</sup>. A study published by De Nederlandsche Bank (2016)<sup>365</sup> suggested that social norms partly shape consumers' perceptions in e-commerce, and consequently their payment behaviour. The prevailing payment habits in one's social

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<sup>359</sup> Goldstein, A., Raphaeli, O., Reichman, S., (2016). Engagement, Search Goals and Conversion - The Different M-Commerce Path to Conversion. ICIS 2016 Proceedings.

<sup>360</sup> Raphaeli, O., Goldstein, A., Fink, L., 2017. Analyzing online consumer behavior in mobile and PC devices: a novel web usage mining approach. ECRA 26, 1–12. <https://doi.org/10.1016/j.elerap.2017.09.003>.

<sup>361</sup> Łysik, Ł., Kutera, R., Machura, P., 2014. Behavioural and technical factors of influence on purchase behaviour of mobile consumers. Proceedings of the 18th International Academic MindTrek Conference on Media.

<sup>362</sup> Tounekti, O., Ruiz-Martínez, A., & Skarmeta Gómez, A. F. (2019). Users Supporting Multiple (Mobile) Electronic Payment Systems in Online Purchases: An Empirical Study of Their Payment Transaction Preferences. IEEE Access, 8, 735–766. doi: <https://doi.org/10.1109/ACCESS.2019.2961785>.

<sup>363</sup> Shaw, B., & Kesharwani, A. (2019). Moderating Effect of Smartphone Addiction on Mobile Wallet Payment Adoption. *Journal of Internet Commerce*, 18(3), 291–319. <https://doi.org/10.1080/15332861.2019.1620045>.

<sup>364</sup> Uldall, B.R. (2013). Social Psychology. In: Runehov, A.L., & Oviedo, L. (eds), *Encyclopedia of Sciences and Religions*. Springer, Dordrecht. [https://doi.org/10.1007/978-1-4020-8265-8\\_1047](https://doi.org/10.1007/978-1-4020-8265-8_1047).

<sup>365</sup> van der Cruijssen, C., & van der Horst, F. (2016). Payment behaviour: the role of socio-psychological factors. De Nederlandsche Bank Working Paper 532/2016.

sphere were also found to influence consumer's behaviour<sup>366</sup>. Both social processes and social conformity concur in the formation of individuals' beliefs and behaviours<sup>367</sup>.

### C.3.2 Internal

Demographic factors such as age, gender, education, occupation, income, and marital status also impact consumer digital payment method choice. Demographics are widely addressed in relevant studies, either as primary subjects of analysis<sup>368</sup> or as control variables<sup>369</sup>. Among these, age, gender, and income, followed by education and occupation are more often found to influence consumer behaviour, whereas marital status is not. The mapped literature suggests that demographics influence both consumer attitude and confidence towards a given payment method type, and the importance attributed to perceived characteristics of a given payment method<sup>370</sup>.

Habits and past behaviours. Research in psychology has shown that when a behaviour is repeated over time, it becomes a habit and the cognitive processes guiding response become automatic<sup>371</sup>. As a result, habits and past experience can influence consumers' choice of online payment methods. The importance of habits lies in their relationship with behaviour repetition, as habits can moderate the effect of trust on purchasing

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<sup>366</sup> Kosse, A., & Jansen, D. (2011). Choosing how to pay: the influence of home country habits. *De Nederlandsche Bank Working Paper* N. 328/2011. [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1977192](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1977192).

<sup>367</sup> Lipari, F. (2018). This Is How We Do It: How Social Norms and Social Identity Shape Decision Making under Uncertainty. *Games*, 9(4), 99. <https://doi.org/10.3390/g9040099>; Ajzen, I. (1996). The social psychology of decision making. In: Higgins, E.T., & Kruglanski, A.W. (Eds.), *Social Psychology: Handbook of basic principles*, (pp-297-325). Guilford Press, New York.

<sup>368</sup> Lohana, S., & Roy, D. (2023). Impact of Demographic Factors on Consumer's Usage of Digital Payments. *FIIB Business Review*, 12(4), 351-473. <https://doi.org/10.1177/23197145211049586>; Christain, T., Sengunthar, L., Christain, O., & Verma, S. (2018). Impact of Demographic Factors on Payment Method Chosen by Indian Consumers using ANOVA. *IJSRSET*, 4(1). National Conference on Advanced Research Trends in Information and Computing Technologies; Ho, H., & Awan, M. (2019). The Gender Effect on Consumer Attitudes Toward Payment Methods: The Case of Online Chinese Customers. *Journal of Internet Commerce*, 18 (2), p.141-169. DOI: 10.1080/15332861.2019.1584010; Vinitha, K. (2017). Influence of demographic variables on usage of e-payment system. *International Journal of Mechanical Engineering and Technology (IJMET)*, 8(11), 265-276. <http://www.iaeme.com/IJMET/issues.asp?JType=IJMET&VType=8&IType=11>; See-To, E., Papagiannidis, S., & Westland, C. (2014). The moderating role of income on consumers' preferences and usage for online and offline payment methods. *Electron Commer Res*, 14, 89-213. DOI 10.1007/s10660-014-9138-3.

<sup>369</sup> Stavins, J. (2017). How do consumers make their payment choices? *Research Data Reports Paper*, (17-1). <https://ssrn.com/abstract=2995875>; Deufel, P., Kemper, J., & Brettel, M. (2019). Pay now or pay later: a cross-cultural perspective on online payments. *Journal of Electronic Commerce Research*, 20(3). [http://www.jecr.org/sites/default/files/2019vol20no3\\_Paper1.pdf](http://www.jecr.org/sites/default/files/2019vol20no3_Paper1.pdf).

<sup>370</sup> Zeeshan, Z.M. (2013). The impact of mobile service attributes on males' and females' purchase decision. *Management and Marketing*, 8(4), 669-682. <https://www.managementmarketing.ro/pdf/articole/332.pdf>.

<sup>371</sup> Ouellette, J. A., & Wood, W. (1998). Habit and intention in everyday life: The multiple processes by which past behavior predicts future behavior. *Psychological Bulletin*, 124(1), 54-74. <https://doi.org/10.1037/0033-2909.124.1.54>; Neal, D. T., Wood, W., & Quinn, J. M. (2006). Habits—A Repeat Performance. *Current Directions in Psychological Science*, 15(4), 198-202. <https://doi.org/10.1111/j.1467-8721.2006.00435.x>; Verplanken, B., & van Knippenberg, A. (2006). Predicting Behavior From Actions in the Past: Repeated Decision Making or a Matter of Habit? *Journal of Applied Psychology*, 28(15), 1355-1374. <https://doi.org/10.1111/j.1559-1816.1998.tb01681.x>.

behaviour in the context of online shopping. Additionally, a habit frames individuals' predisposition to complete payments, particularly among frequent consumers<sup>372</sup>.

Heuristics and biases are interrelated concepts. Heuristics are simplification strategies (rules of thumb) that assist the individual in problem-solving and decision-making. They reduce cognitive effort by reducing the amount of information and analysis needed to make a decision<sup>373</sup>. Biases are systemic errors in decision-making stemming from this simplification process, leading to irrational, suboptimal, or inexact decisions<sup>374</sup>. As an example, a recent study highlights that a combination of different behavioural biases, namely overconfidence, and risk aversion, impact the adoption of digital services<sup>375</sup>.

We have identified a set of 8 cognitive mechanisms as potentially affecting consumers' choices of digital payment methods.

- Loss aversion is individuals' tendency to dislike losses more than they like equivalent gains. Accordingly, the consideration of sure losses outweighs that of equivalent gains during decision-making<sup>376</sup>. Also, loss aversion plays a role in increasing inertia, i.e. in maintaining the status quo. This bias has direct consequences on digital payment method choice. For instance, common business practices such as default setting may capitalise on loss aversion to induce the consumer to choose a specific option in spite of others. Research suggests that keeping defaults reflects loss aversion because options are evaluated as gains or losses to a neutral reference point. When the reference point is represented by the default option, the prospect of losing the option makes it seem more valuable compared to the prospect of gaining it, explaining why individuals tend to keep defaults.<sup>377</sup> Similarly, loss aversion also drives decision inertia, discouraging payment method change<sup>378</sup>. According to the mechanism presented above, when the status-quo represents the reference point, the disadvantages of losing it are deemed larger than the advantages of changing it.<sup>379</sup> Platform steering

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<sup>372</sup> Kemper, J., & Deufel, P. (2018). Show me how you buy and I will tell you how you pay: The situational effect on payment method choice in e-commerce. Conference Paper – ECIS 2018 Proceedings.

<sup>373</sup> Dale, S. (2015). Heuristics and biases: The science of decision-making. *Business Information Review*, 32(2), 93-99. <https://doi.org/10.1177/0266382115592536>.

<sup>374</sup> Korteling, J.E., & Toet, A. (2022). Cognitive biases. *Encyclopedia of Behavioral Neuroscience, Second Edition*, 610-619. <https://doi.org/10.1016/B978-0-12-809324-5.24105-9>.

<sup>375</sup> Jain, N., Raman, T. V., & Bhardwaj, G. N. (2023). Do Behavioural Biases Drive Adoption of Digital Banking Services? The Moderating Role of User Type. *Global Business Review*, 0(0). <https://doi.org/10.1177/09721509231160865>.

<sup>376</sup> Kahneman, D., & Tversky, A. (1979). Prospect theory: an analysis of decision under risk. *Econometrica*, 47(2). [https://www.jstor.org/stable/pdf/1914185.pdf?refreqid=fastly-default%3Ab05a48a94447c755fb8bccdd9ccaed5c&ab\\_segments=&origin=&initiator=&acceptTC=1](https://www.jstor.org/stable/pdf/1914185.pdf?refreqid=fastly-default%3Ab05a48a94447c755fb8bccdd9ccaed5c&ab_segments=&origin=&initiator=&acceptTC=1); Fryer Jr, R. G., Levitt, S. D., List, J., & Sadoff, S. (2012). Enhancing the efficacy of teacher incentives through loss aversion: A field experiment (No. w18237). *National Bureau of Economic Research*.

<sup>377</sup> Dhingra, N., Gorn, Z., Kener, A., & Dana, J. (2012). The default pull: An experimental demonstration of subtle default effects on preferences. *Judgment and Decision Making*, 7(1), 69-76. doi:10.1017/S1930297500001844.

<sup>378</sup> Swiecka, B., Terefenko, P., & Paprotny, D. (2021). Transaction factors' influence on the choice of payment by Polish consumers. *Journal of Retailing and Consumer Services*, 58. <https://doi.org/10.1016/j.jretconser.2020.102264>.

<sup>379</sup> Kahneman, D., Knetsch, J., & Thaler, R. (1991). Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias. *Journal of Economic Perspectives*, 5(1), 193- 206.

mechanisms, such as surcharging or rebating, might also influence consumers' preferences. According to loss aversion, consumers are expected to avoid losses more than they seek equivalent gains. This means that even if the final cost is the same, an option that involves surcharging may be dismissed for one involving rebating.

- Risk aversion refers to the human predisposition to privilege certainty and safety to uncertainty and potential loss, and as such, to choose the less risky option all other things held equal, or to refrain from a decision to avoid risk. Studies in the fields of neuropsychology and behavioural economics highlight that risk is highly considered in the process of choosing an e-payment method. For instance, research shows that e-payments perceived as risky activate areas of the brain associated with unwanted or negative emotional processing<sup>380</sup>. Also, while risk is generally considered regardless of the monetary value of the purchase, it becomes more influential for e-payment choice in the event of expensive purchases compared to cheap ones<sup>381</sup>.
- Regret aversion guides decision towards the option that is perceived as bringing the least regret, rather than towards the optimal one. This cognitive bias influences behaviour in several contexts, including consumption. Research has highlighted that risk-averse subjects tend to process decision-making more carefully, and this influences both the length of the decision-making process (i.e., the decision is lengthier) and the amount of information needed to make a decision<sup>382</sup>. Although there is a lack of studies exploring the specific relationship between digital payment method selection and regret aversion, these findings suggest that the content and amount of information regarding the available payment method on the purchasing platform might influence choice (see anchoring bias).
- Social norms contribute to the formation of individual preferences and behaviour. Biases deriving from social norms confront the individual with a trade-off between informed decision-making and social conformity. This impacts belief and preference formation about information acquisition or avoidance, thus conditioning decision-making<sup>383</sup>. Both descriptive social norms, i.e. what the individual perceives others are doing, and injunctive social norms, i.e. what the individual perceives others approve of, and injunctive messages, i.e. messages

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<sup>380</sup> Rajagopal, N., Ramkumar, G., Yousoof, M., Tripathi, A., & Kakade, K. (2022). Neuropsychological study of how shoppers handle dubious transactions and make online payments. *Journal of Contemporary Issues in Business and Government*, 28(4). DOI: 10.47750/cibg.2022.28.04.049; Casado-Aranda, L., Liebana-Cabanillas, F., & Sancez-Fernandez, J. (2018). A neuropsychological study on how consumers process risky and secure e-payments. *Journal of Interactive Marketing*, 43, 151-164. <https://doi.org/10.1016/j.intmar.2018.03.001>.

<sup>381</sup> Alarooj, N. (2019). Which factors influence consumers' choice of payment method when purchasing online? Auckland University of Technology, Faculty of Business, Economics and Law - Department of Marketing.

<sup>382</sup> Reb, J. (2008). Regret aversion and decision process quality: Effects of regret salience on decision process carefulness. *Organizational Behavior and Human Decision Processes*, 105, 169–182.

<sup>383</sup> *Supra*, note 6 (Lipari, 2018).

conveying social (dis)approval, influence individual preferences and behaviour<sup>384</sup>. For instance, studies on mobile payment highlight that social antecedents affect consumer attitudes towards payment methods<sup>385</sup>. Crowd influencing, i.e. the perceived social pressure to act or not to act, has also been found to have a direct impact on online payment behaviour<sup>386</sup>.

- Overconfidence is the tendency of individuals to overestimate both their knowledge and abilities, causing them to underestimate risks in different situations, including in financial behaviour, online purchasing, and new technology uptake<sup>387</sup>. For example, overconfidence may lead a consumer to not get informed about the different options, as they assume they already have all the knowledge necessary to make an optimal decision. This might lead them to overlook or overestimate the alternatives, resulting in a suboptimal choice in terms of costs, security, or ease of use. The literature review revealed that most studies addressing the overconfidence bias are conducted in relation to investment behaviour. Thus, there is much room for exploring its influence on consumers' digital payment method choice in the experimental part of the study.
- Anchoring is a widely studied effect in consumer research. Being among the most robust heuristics, it has been proven to have many effects on decision-making<sup>388</sup>. This bias relates to the disproportionate influence of an initial piece of information (the anchor) on decision-making, which produces a biased outcome<sup>389</sup>. In an experimental study conducted in 2003, anchors produced a system of 'coherent arbitrariness', which did not diminish as consumers' experience with a good increase<sup>390</sup>. This is visible in product recommendation systems: research shows that product recommendations displayed on purchasing platforms bias decisions through the anchoring effect<sup>391</sup>. As the literature demonstrates, the anchoring effect provides several insights into the potential influence of certain platform

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<sup>384</sup> Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological Science*, 18(5), 429-434. <https://doi.org/10.1111/j.1467-9280.2007.01917.x>; Melnyk, V., van Herpen, E., Jak, S., & van Trijp, H. (2019). The Mechanisms of Social Norms' Influence on Consumer Decision Making. A Meta Analysis. *Zeitschrift für Psychologie*, 227(1). <https://doi.org/10.1027/2151-2604/a000352>.

<sup>385</sup> Zhang, J. & Mao, E. (2019). Cash, credit, or phone? An empirical study on the adoption of mobile payments in the United States. *Psychology and Marketing*, 37(1). <https://doi.org/10.1002/mar.21282>; Nur, T., & Panggabean, R. (2021). Factors Influencing the Adoption of Mobile Payment Method among Generation Z: the Extended UTAUT Approach. *Journal of Accounting Research, Organization and Economics*, 4(1), 4-28.

<sup>386</sup> Hoa, N., Hien, L., & Lien, V. (2019). Studying the factors affecting online payment decision: a case of Vietnamese costumers. *Journal of Management Information and Decision Sciences*, 22(1). 1532-5806-22-1-124.

<sup>387</sup> *Supra*, note 14.

<sup>388</sup> Furnham, A., & Boo, H. (2010). A literature review of the anchoring effect. *The Journal of Socio-Economics*, 40(1), 35-42. <https://doi.org/10.1016/j.socec.2010.10.008>.

<sup>389</sup> *Ibidem*; Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, 211(4481), 453-8. doi: 10.1126/science.7455683. PMID: 7455683.

<sup>390</sup> Ariely, D., Loewenstein, G., & Prelec, D. (2003). "Coherent arbitrariness": Stable demand curves without stable preferences. *The Quarterly Journal of Economics*, 118(1), 73 -106. <https://doi.org/10.1162/00335530360535153>.

<sup>391</sup> Köcher, S., Jugovac, M., Jannach, D., & Holzmüller, H. (2019). New Hidden Persuaders: An Investigation of Attribute-Level Anchoring Effects of Product Recommendations. *Journal of Retailing*, 95(1), 24-41. <https://doi.org/10.1016/j.jretai.2018.10.004>.

features and business strategies on consumers' decisions. Our review identified a research gap regarding the impact of anchoring on payment method choice, though intuitively it is likely that anchoring affects this choice as well.

- The present bias is a cognitive mechanism according to which individuals tend to choose small but immediate rather than big but future rewards, even when it goes against their long-term aims and preferences. A study by Hardisty et al. (2013) provides interesting insights into the connection between the present bias and the possible influence of offers and discounts on consumer choice. Their findings point to the fact that the present bias is stronger when consumers consider losses rather than gains<sup>392</sup>. This implies that fees have a more relevant effect on digital payment method choice compared to rewards<sup>393</sup>. Studies exploring the nature of decision-making when using a smartphone compared to a computer revealed that the present bias has a stronger effect in the first case, meaning that the consumer is less likely to delay gratification compared to when purchasing on a laptop<sup>394</sup>. The reason for this is unknown.
- The status-quo bias relates to individuals' tendency to prefer the maintenance of the current state of affairs, or not to act to change the status quo, even when doing so would be beneficial. As a result of this bias, consumers stick to pre-existing behavioural patterns (a phenomenon known as decision inertia), especially if they are habituated<sup>395</sup>. Research has highlighted that the status-quo bias slows down payment method change<sup>396</sup>.

#### C.4 Treatment variables – Purchase characteristics

Treatment variables pertain to the purchase characteristics, namely the features of the platform where the purchase is made and the available payment methods. They influence outcomes both directly and indirectly, by shaping consumers' perceptions of the options through the mediating variables. This group of variables and their effects on the outcomes will be explored during the experimental part. With regards to platform features, relevant variables are (i) appearance and popularity, (ii) the way in which options are framed and displayed, (iii) the available payment options, and (iv) the presence of defaults and access to website cookies (access to cookies can give the platform the opportunity to pre-fill information and therefore change the decision environment). Variables relating to payment method features are (vii) framing effects, (viii) perceived ease of use and convenience, and (ix) transaction costs (monetary and

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<sup>392</sup> Hardisty, D., Appelt, K., & Weber, E. (2013). Good or Bad, We Want it Now: Fixed-cost Present Bias for Gains and Losses Explains Magnitude Asymmetries in Intertemporal Choice. *Journal of Behavioral Decision Making*, 26, 348–361. DOI: 10.1002/bdm.1771.

<sup>393</sup> TNS Infratest (2013). Study on the effects of information disclosure on consumer choice of payment instruments. 955e7670-852e-47e2-9c92-bc2c26c70e9f\_en (europa.eu).

<sup>394</sup> Wilmer, H., & Chein, J. (2016). Mobile technology habits: patterns of association among device usage, intertemporal preference, impulse control, and reward sensitivity. *Psychonomic Bulletin & Review*, 23, 1607–1614. <https://doi.org/10.3758/s13423-016-1011-z>; Mograbi, E. (2022). Decision-makers are more impulsive on smartphones than on computers. *Journal of Behavioral and Experimental Economics*, 100. <https://doi.org/10.1016/j.socec.2022.101916>.

<sup>395</sup> Polites, G. I., & Karahanna, E. (2012). Shackled to the Status Quo: The Inhibiting Effects of Incumbent System Habit, Switching Costs, and Inertia on New System Acceptance. *MIS Quarterly*, 36(1), 21–42. <https://www.jstor.org/stable/41410404>.

<sup>396</sup> Loh, X-M., Lee, V-H., Tan, G., Ooi, K-B., & Dwivedi, Y.K. (2021). Switching from cash to mobile payment: what's the hold-up?. *Internet Research*, 31(1), 376–399. <https://doi.org/10.1108/INTR-04-2020-0175>.

non-financial) deriving from payment option and platform characteristics, as well as from steering mechanisms.

Display practices are part of businesses' marketing strategies, using the well-documented fact that consumers' decisions are influenced by the way in which the different options are presented. They capitalise on individuals' cognitive biases to inform preferences and influence behaviour. Our literature review revealed a lack of digital payment-specific literature with regards to some business models and practices. However, literature on choice architecture proves that such techniques have the potential to influence decisions by tapping into individuals' cognitive biases<sup>397</sup>, and that they are replicable in different decision-making environments and on different subjects<sup>398</sup>. It is thus reasonable to infer that they may also influence the choice of payment method. Through the review several practices used to influence digital payment method choice have been identified.

- Framing is used to induce consumers to choose a particular option. While there is a lack of evidence specific to digital payment method choice, literature on framing in finance and marketing affirms that presenting an option as a gain (positive framing) or as a loss (negative framing) impacts consumers' online payment decisions by shaping their perceptions of, for instance, security, fees, convenience, by tapping into loss and risk aversion<sup>399</sup>. Behavioural literature<sup>400</sup> highlights that framing techniques have an impact on payment selection because of the framing effect. According to such effect, the way in which information is presented affects individuals' choice behaviour by shaping their preferences, even when the content or options remain the same.
- Default setting involves the automatic selection of a payment option. This practice significantly influences user behaviour by simplifying the payment process, making the default payment option more likely to be chosen<sup>401</sup>. Default setting as a strategy relies on status quo bias, decision inertia, and loss aversion. Loss

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<sup>397</sup> Johnson, E., Shu, S., Dellaert, B., Fox, C., Goldstein, D., Häubl, G., Larrick, R., Payne, J., Peters, E., Schkade, D., Wansink, B., & Weber, E. (2012). Beyond nudges: Tools of a choice architecture. *Marketing Letters*, 23, 487-504. <https://link.springer.com/article/10.1007/s11002-012-9186-1>.

<sup>398</sup> Münscher, R., Vetter, M., & Scheuerle, T. (2016). A review and taxonomy of choice architecture techniques. *Journal of Behavioral Decision Making*, 29, 511-524. DOI:10.1002/bdm.1897.

<sup>399</sup> Kirchler, E., Maciejovsky, B., & Weber, M. (2005). Framing Effects, Selective Information and Market Behavior: An Experimental Analysis. *Journal of Behavioral Finance*, 6(2), 90-100. [https://psycnet.apa.org/doi/10.1207/s15427579jpfm0602\\_4](https://psycnet.apa.org/doi/10.1207/s15427579jpfm0602_4);

Dixit, A., Hall, K., & Dutta, A. (2014). Psychological influences on customer willingness to pay and choice in automated retail settings Context effects, attribute framing, and perceptions of fairness. *American Journal of Business*, 29(3/4), 237-260. DOI 10.1108/AJB-06-2014-0036;.

Giuliani, F., Cannito, L., Gigliotti, G., Rosa, A., Pietroni, D., & Palumbo, R. (2022). The joint effect of framing and defaults on choice behaviour. *Psychological Research*, 87, 1114-1128. <https://doi.org/10.1007/s00426-022-01726-3>.

<sup>400</sup> Giuliani, F., Cannito, L., Gigliotti, G., Rosa, A., Pietroni, D., & Palumbo, R. (2022). The joint effect of framing and defaults on choice behaviour. *Psychological Research*, 87, 1114-1128. <https://doi.org/10.1007/s00426-022-01726-3>; Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*. 1981, 211(4481), 453-8. doi: 10.1126/science.7455683. PMID: 7455683.

<sup>401</sup> Deloitte Service for Financial Payments. (2016). "Default" payment methods.

aversion also contributes to the maintenance of default settings, provided that the option does not present clear losses<sup>402</sup>.

- Up-Streaming involves offering a payment option earlier in the purchase process compared to other options. This technique generally is about displaying the business' preferred option up-front, before the consumer reaches the cart section with the different payment options. Also, it can take the form of accelerated single-item purchases<sup>403</sup>, where a payment method is inserted on product-detail pages to speed up the purchase of single products. Up-streaming techniques alter the decision environment, increasing the likelihood of selecting the up-streamed method. The mechanism underlying these strategies is the saliency effect. This type of framing drives consumers to give more relevance to the more prominent option(s)<sup>404</sup>. Literature also suggests that the effects of order on the evaluation of available options. In the case of short and easy-to-process lists of options (as in the case of different payment methods), there is a 'primacy effect', i.e. option judgement tends to anchor on the first item according to a cognitive process similar to the anchoring bias<sup>405</sup>.
- Previously selected. Through the saliency and primacy effects, displaying previously selected options at the top of the list can influence choice. The behavioural mechanism at play is the same as up-streaming, as more saliency is given to the item displayed at the top of the list. In addition, the status quo bias and confirmation bias, i.e. the tendency to give more prominence to what confirms existing judgements or beliefs, can also contribute to influencing the individual into choosing the previously selected payment option.
- Primary payment options are used to make the choice of a specific payment method more likely by increasing its saliency compared to other options. This can be done in different ways, for instance, by making the option bigger, or by placing it on top of the option list<sup>406</sup>.
- Information provision can be used to affect decisions by, in particular, capitalising on the anchoring bias. Lack of information induce consumers to overweigh the features common to all options, at expenses of the unique ones. When information is missing unique attributes are evaluated based on the common ones, and missing information is more likely to be deemed irrelevant for the options with higher common attribute values<sup>407</sup>. These mechanisms influence the importance of certain attributes in decisions, potentially disadvantaging the options that have a higher number of unique features. On the other hand, abundant or elaborated information shapes consumers' choices by increasing their confidence and thus

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<sup>402</sup> Johnson, E., Bellman, S., & Lohse, G. (2001). Defaults, framing and privacy: why opting in-opting out. *Marketing Letters* 13, 5–15. <https://doi.org/10.1023/A:1015044207315>.

<sup>403</sup> [Apple Pay | Apple Developer Documentation](#).

<sup>404</sup> Milutinovic, G., Ahonen-Jonnarth, U., & Seipel, S. (2021). Does visual saliency affect decision-making?. *Journal of Visualization*, 24, 1267-1285. <https://doi.org/10.1007/s12650-021-00760-4>.

<sup>405</sup> de Bruin, W., & Keren, G. (2003). Order effects in sequentially judged options due to the direction of comparison. *Organizational Behavior and Human Decision Processes*, 92, 91–101. doi:10.1016/S0749-5978(03)00080-3.

<sup>406</sup> Supra, note 42.

<sup>407</sup> Kivetz, R., & Simonson, I. (2000). The effects of incomplete information on consumer choice. *Journal of Marketing Research*, 37(4), 427-448. <https://doi.org/10.1509/jmkr.37.4.427.18796>.

reducing the cognitive effort related to the decision process<sup>408</sup>. However, when information becomes excessive it can as well overwhelm consumers, blocking or leading to suboptimal decision-making<sup>409</sup>.

- Product recommendation systems are specifically designed to guide decision-making, and their effects are stronger when decision happens online. A study by Senecal & Nantel<sup>410</sup> found that consulting product recommendations doubles the likeliness of choosing the recommended product. These systems capitalise on individuals' anchoring bias. In addition, saliency draws attention towards the options that are similar to the recommended one. Accordingly, the decision outcome is biased towards the recommended option<sup>411</sup>.

Offers, rewards, and steering mechanisms may guide consumers' choices by making one option more appealing than another. The literature review identified a research gap in this field, however, the few studies available highlight that participating in reward programs is a relevant factor in payment method choice. Not only is this factor a strong predictor of decision but it is also associated with payment method change. Interestingly, the value of rewards does not have a noticeable impact on decisions, whereas the very *presence* of a reward program itself does<sup>412</sup>. Additionally, steering mechanisms used by platforms influence consumers' behaviour by adding or removing transaction costs from certain options, or by adding conditions to the choice of others. For instance, mechanisms like surcharging or rebating change transaction costs for certain options, making them more or less appealing than others. Similarly, conditional mechanisms such as accepting a payment method only above a certain price threshold, may render some options inconvenient, thus inducing the consumer to change their preference. Literature on loss aversion and regret aversion may offer some inferences on the underlying behavioural mechanism. Accordingly, consumers are more likely to choose the payment option which offers a reward because of their tendency to avoid certain losses<sup>413</sup> (i.e. renouncing to the reward) and to lean towards the option that will bring less regret<sup>414</sup>. Perceived ease of use and convenience (i.e. perceived non-financial costs) are recognised as factors that influence consumer preferences. Several studies have highlighted that users greatly prioritise ease of use when selecting a payment

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<sup>408</sup> Tan, W., Tan, C., & Teo, H. (2012). Consumer-based decision aid that explains which to buy: Decision confirmation or overconfidence bias?. *Decision Support Systems*, 53(1) 127-141. <https://doi.org/10.1016/j.dss.2011.12.010>.

<sup>409</sup> Roetzel, P. G. (2019). Information overload in the information age: a review of the literature from business administration, business psychology, and related disciplines with a bibliometric approach and framework development. *Business Research*, 12, 479-522. <https://doi.org/10.1007/s40685-018-0069-z>.

<sup>410</sup> Senecal S., & Nantel, J. (2004). The influence of online product recommendations on consumers' online choices. *Journal of Retailing*, 80(2), 159-169. <https://doi.org/10.1016/j.jretai.2004.04.001>.

<sup>411</sup> *Supra*, note 43.

<sup>412</sup> Arango, C., Huynh, K., & Sabetti, L. (2015). Consumer payment choice: Merchant card acceptance versus pricing incentives. *Journal of Banking & Finance*, 55, 130-141. <https://doi.org/10.1016/j.jbankfin.2015.02.005>.

<sup>413</sup> *Supra*, note 15, (Kahneman & Tversky, 1979).

<sup>414</sup> *Supra*, note 21.

method, preferring payment methods that are simple and straightforward<sup>415</sup>. Convenience and availability similarly influence how consumers pay. The literature reviewed suggests that accessibility and integration with preferred platforms are important predictors of behaviour<sup>416</sup>, together with flexibility<sup>417</sup>, perceived advantage<sup>418</sup>, and performance and effort expectancy<sup>419</sup>, although the latter has been disputed by Martinez & McAndrews (2022), who concluded that effort expectancy is a poor predictor of intention when it comes to mobile payment solutions<sup>420</sup>. The relevance of ease of use and convenience in digital payment method choice is well exemplified by the spread of e-wallet applications.

Financial costs involve all costs and charges linked to the use of a given payment method. Hirschman's historical study<sup>421</sup> suggests that price-related factors can influence consumer purchase behaviours based on payment methods. This aligns with both classic economic theory where cost considerations can impact choices and with specific studies identified during the literature review, which provide evidence that transaction fees and other costs shape consumer preferences<sup>422</sup>. Financial costs can also induce the consumer into choosing an alternative to their normally preferred method<sup>423</sup>.

## C.5 Mediating variables – perception of options

Mediating variables relate to individual perceptions of the options in terms of control over the purchase. They concern the level of familiarity, trust, and ease of consumers in using an option, and stream from the decision environment (directly) and purchase characteristics (indirectly). Based on the evidence collected, relevant variables related

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<sup>415</sup> He, F., & Mykytyn, P. (2008). Decision factors of the adoption of e-finance and other e-commerce systems. Americas Conference on Information Systems (AMICIS) 2008 Proceedings. <http://aisel.aisnet.org/amcis2008/229>; Ozkan, S., Bindusara, G., & Hackney, R. (2010). Facilitating the adoption of e-payment systems: theoretical constructs and empirical analysis. *Journal of Enterprise Information Management*, 23(3), 305-325. <https://doi.org/10.1108/17410391011036085>; Tounekti, O., Ruiz-Martínez, A., & Skarmeta Gómez, A. F. (2019). Users Supporting Multiple (Mobile) Electronic Payment Systems in Online Purchases: An Empirical Study of Their Payment Transaction Preferences. *IEEE Access*, 8, 735-766. doi: <https://doi.org/10.1109/ACCESS.2019.2961785>.

; Liebana-Cabanillas, F., Kalinic, Z., Munoz-Leiva, F., & Higuera-Castillo, E. (2024). Biometric m-payment systems: A multi-analytical approach to determining use intention. *Information & Management*, 61(2). <https://doi.org/10.1016/j.im.2023.103907>.

<sup>416</sup> Stavins, J. (2017). How do consumers make their payment choices? *Research Data Reports Paper*, (17-1). <https://ssrn.com/abstract=2995875>.

<sup>417</sup> *Supra*, note 21.

<sup>418</sup> *Supra*, note 54 (Ozkan et al., 2010).

<sup>419</sup> *Supra*, note 24 (Nur & Panggabean, 2021); *Supra*, note 31 (Liebana-Cabanillas et al., 2024).

<sup>420</sup> Martinez, B, & Mc Andrews, L. (2022). Do you take...? The effect of mobile payment solutions on use intention: an application of UTAUT2. *Journal of Marketing Analytics*, 11, 458-469. <https://doi.org/10.1057/s41270-022-00175-6>.

<sup>421</sup> Hirschman, E. C. (1979). Differences in consumer purchase behaviour by credit card payment system. *Journal of Consumer Research*, 6(1), 58-66. <https://doi.org/10.1086/208748>.

<sup>422</sup> *Supra*, note 1 (Tounekti et al., 2019);.

Harsono, B. D. (2018). Consumer preference of choosing e-payment system for online shopping using conjoint analysis. *International Journal of Science and Research*, 8(2), 1333-1338. DOI: 10.21275/ART20195473.

<sup>423</sup> Stavins, J. (2018). Consumer preferences for payment methods: Role of discounts and surcharges. *Journal of banking and Finance*, 94, 35-53. <https://doi.org/10.1016/j.jbankfin.2018.06.013>.

to the platform are (i) previous experience with the platform, and (ii) knowledge and trust of the seller. Similarly, relevant variables linked to the payment methods are (i) knowledge of and experience with the payment methods, and (ii) the trust and perceived security of the available options.

Perceived security and trust are paramount in the field of digital payments<sup>424</sup>. The literature review found, not surprisingly, that these factors are major determinants of online payment choice, being among the most considered platform and payment method characteristics during decision-making.

Numerous evidence support this inference: a study by Tounekti, Ruiz-Martínez, & Skarmeta Gómez (2019) concluded that security is a necessary payment system feature for adoption and a main determinant of choice<sup>425</sup>. In addition, perceived security contributes to lowering financial fear perception, directing the consumer towards a certain choice<sup>426</sup>.

The importance of perceived security and trustworthiness is also evident in the recent increase in the use of e-wallet applications (apps). Especially since the Covid-19 pandemic, e-wallets have become a popular digital payment method, valued for being safe and convenient. They introduce high-security elements in online shopping, especially with regards to personal and credit card data without making the payment experience long and tedious. Thus, they offer a solution in which security is prioritised without renouncing to flexibility, speed, and practicality<sup>427</sup>. The importance of perceived security and trustworthiness for consumer choice is also further highlighted by the fact that offering payment methods with a good reputation in terms of security can increase vendor reputation, ultimately influencing the final decision regarding the payment method<sup>428</sup>.

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<sup>424</sup> Xu, Q., & Riedl, R. (2011). Understanding Online Payment Method Choice: An Eye-tracking Study. *ICIS 2011 Proceedings*, 18. <https://aisel.aisnet.org/icis2011/proceedings/humanbehavior/18/>.

<sup>425</sup> *Supra*, note 1 (Tounekti et al., 2019).

<sup>425</sup> Ozkan, S., Bindusara, G., & Hackney, R. (2010). Facilitating the adoption of e-payment systems: theoretical constructs and empirical analysis. *Journal of Enterprise Information Management*, 23(3), 305-325. <https://doi.org/10.1108/17410391011036085>.

<sup>426</sup> El Haddad, G., & Aimeur, E. (2018). Understanding Trust, Privacy and Financial Fears in Online Payment. *17th IEEE International Conference On Trust, Security And Privacy In Computing And Communications/12th IEEE International Conference On Big Data Science And Engineering*.

<sup>427</sup> Yılmaz, E. S. (2022). QR CODES AND E-WALLET APPLICATIONS IN DIGITAL ERA. HOW DO THEY INFLUENCE THE DIGITAL MARKETING STRATEGIES?. *Digital Transformation: A Human-Centric Approach*, 91.

<sup>428</sup> Köster, A., Matt, C., & Hess, T. (2016). Carefully choose your (payment) partner: How payment provider reputation influences m-commerce transactions. *Electronic Commerce Research and Applications*, 15, 26-37. <https://doi.org/10.1016/j.elerap.2015.11.002>.

## C.6 Drawing conclusions

Several factors simultaneously concur to inform consumer's choice of digital payment methods. After reviewing the empirical evidence collected, we were able to flag those factors that have been most often recognised as the main predictors influencing the payment method decision. This is something that will be further explored in the experimental part (Mystery Shopping); the purpose of this section is only to present insights derived from the literature.

### C.6.1 Main factors at play

Among internal factors, heuristics and biases together with perceived ease of use and convenience are the most important predictors according to the collected literature.

Many of the studies we have reviewed emphasise risk and perceived security as relevant influencing factors of online payment behaviour, suggesting loss and risk aversion greatly influence consumers' digital payment method choice. This finding is reinforced by three strands of literature.

First, studies focussing on cognitive biases confirm the influence of loss and risk aversion on decision-making processes. Second, research on framing and other business practices highlights the impact of strategies capitalising on cognitive biases affected by framing, such as loss aversion and anchoring. Lastly, literature related to the anticipated pain of payment demonstrates the role of aversion in constructing preferences, attitudes, and behaviour<sup>429</sup>.

The collected literature also supports the inference that perceived ease of use and convenience are among the most relevant variables.

According to our literature review, external factors which have a greater influence on

As anticipated above, research identifies perceived security and trust as major determinants of decision in the field of online payment methods. These characteristics can be analysed both with regards to payment platforms and payment methods and therefore their proven relevance constitutes a precious insight for this work. Certain business practices are also especially important. Abundant literature demonstrates that the way in which options are presented shapes preferences and decisions. Considering the literature on framing effects, practices based on framing are expected to be relevant predictors of decision outcomes. It is necessary to point out that academic literature on business practices is limited. Thus, it is only possible to hypothesise that they will be found to be influential in the experimental part of this study.

## C.7 Appendix: Methodology

The literature review is part of the preparatory stage of the present study and serves the objective of compiling insights and viewpoints from previous research on consumer preferences on payment methods. During this phase, our team identified the most important determinants (factors) of payment method choice together with research gaps that highlight the need of additional research to enhance our collective understanding.

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<sup>429</sup> This article summarises existing literature on pain of payment. Reshadi, F., & Fitzgerald, P. (2023). The pain of payment: A review and research agenda. *Psychology & Marketing*, 40(2), 1672-1688. DOI: 10.1002/mar.21825.

The review process proved essential for the development of this study. It provided an in-depth understanding of the main factors at stake and how they influence consumer behaviour within this context. In addition, the collected insights were used to refine the behavioural model and to inform the design of the other data collection activities useful for the purpose of chapter 1.

### C.7.1 Collection and selection of relevant sources

The literature review process was conducted systematically to determine the factors influencing payment method preference. Here, the term factor is used to indicate the variables that potentially influence digital payment method decisions. First, for each factor a small number (1-2) of pertinent academic works was identified according to the three steps listed below; this constituted the backbone of the review. The following step was to enrich the baseline information, both with additional academic literature and with evidence from geographically or thematically relevant case studies, as well as technical and other non-academic literature.

The selection process was conducted to identify a satisfactory number of studies from different academic fields for each factor and reach a broad coverage in terms of approaches, methodologies, and perspectives covered. This was done in three steps:

1. A preliminary selection was made according to the pertinence of each paper's abstract and conclusion with the research question and the topic under investigation. During this phase, papers covering more than one factor were flagged, and either assigned to the main category covered or across two or more categories. It must be noted that due to a lack of studies on some of the investigated factors, the level of pertinence of selected studies with the topic varied.
2. The papers were examined in detail to check the quality of findings and to control for duplicates.
3. The overall content of the literature for each factor was assessed and, where necessary, completed through further research.

To ensure the development of a complete and informed overview, our collection of sources and its extraction of information also looked for the combined effects of different types of factors on choice in broader contexts, such as financial and purchasing behaviour.

The main key search terms used for our review are summarised below.

**Table C.2: Main key search terms**

Digital payment methods
Decision-making on payment methods
Choice in e- and m-transactions
Behavioural biases in online purchasing
Choice architecture

*Source: Project Team elaboration*

The aim of the review was to collect empirical evidence on decision-making in online purchasing decisions. Based on the preliminary research and categorisation, relevant literature was collected for each factor. The review process provided precious insights into three aspects. Firstly, a clearer picture of the impact and the behavioural mechanism behind each factor emerged. This enhanced knowledge informed a provisional list of the factors which have the greatest impact on decision outcomes.

Lastly, the preliminary categorisation and types of factors, as well as the evidence-based behavioural model, were adjusted and refined according to the most important findings.

A total of 90 academic and technical sources from different research fields (behavioural economics, neuropsychology, social psychology, marketing, and social sciences) were retrieved from databases such as Google Scholar, Science Direct, APA PsychInfo, and Galileo Discovery, based on the three-step methodology described above. The research deemed relevant was then mapped according to factor categorisation, following the division between internal and external factors, and with due attention to device type and sub-factors where present. Information deemed as especially relevant for the purpose of this study was extracted to inform a detailed overview, which will provide a solid theoretical basis for this study. Specifically, the literature considered most relevant was that providing evidence on which factors influence decision making in the fields of digital payments. Studies focussing on the cognitive mechanisms behind online purchasing behaviour, as well as on other factors related to financial, socio-psychological, and demographic factors were considered. In addition, literature on online marketing strategies both in e-commerce and m-commerce, and on device type influence on decision-making were included.

The table below shows the collection of studies examined during the review.

Table C.3: Sources collected

	Factor type	Sub-factor	Number of studies
Internal	Sociopsychological factors		5
	Habits and past experience		9
	Heuristics and biases	General	7
		Loss aversion	3
		Risk aversion	3
		Regret aversion	1
		Social norms (descriptive and injunctive)	3
		Overconfidence	3
		Anchoring bias	3
		Present bias	1
		Status-quo bias	1
	Ease of use and convenience		10
	Demographics		8
External	Framing effect		8
	Type of device utilised		6
	Security and trust		9
	Financial costs		5
	Business models and practices	General	1
		Default setting	8
		Up-streaming - option upfront	4
		Previously selected	1
		Information provision	1
Offers/promotions/rewards		2	
Product recommendation		2	
TOTAL			104
Actual number*			90

Source: Project Team elaboration

Note: (\*) The actual number of articles is smaller than the arithmetical sum because some articles cover more than one factor.

### C.7.2 Research gaps and mitigation strategy

The primary objective of the literature review was to compile insights and viewpoints from previous research on consumer preferences on payment methods. Also, it identified existing gaps in this field. While works on consumer behaviour in online payments were abundant, only a small amount of literature was specific to digital

payment methods. This gap was found across different research fields, with the most specific studies found within the realm of behavioural economics and marketing<sup>430</sup>.

Our research team systematically addressed these gaps. In cases where a certain topic had little or no research available, the terms of research utilised during the search were adjusted according to a logic of proximity with the target topic. The preferred alternative topic regarded online and mobile payment services. When relevant literature was not available, further desk research was carried out using the second preferred topic, i.e. consumer preference for payment method. The table below shows the list of alternative topics searched in order of preference.

**Table C.4: Alternative searched topics**

Alternative topics - general research gap	
1	Online/mobile payments services
2	Consumer preference for payment method
3	E-finance/e-commerce and m-commerce
4	Payment behaviour

*Source: Project Team elaboration*

The alternative research items were decided based on the essential concepts of the topic, i.e. 'digital', 'payment method', and 'behaviour'. Following the availability of research on each keyword, prominence was given to studies focusing on the digital and online domain, followed by studies on consumers' payment method preferences, on behaviour in e-finance and e-commerce and m-commerce, and finally on payment behaviour.

A research gap was also identified concerning business models, especially 'information provision' and 'displaying previously selected options'. Studies on business models mostly focus on 'default setting' and 'up-streaming', while other practices are scarcely documented. In this case, addressing the gap was more challenging, thus, two strategies were developed:

- A series of alternative research inputs were used according to a logic of proximity with the preferred term for browsing. In the case of information provision, 'incomplete information' and 'order of information' were searched. 'Past method choice' was used as an alternative input for 'previously selected options'.
- A second strategy was developed due to the encountered difficulties in finding relevant evidence. Because business models capitalise on individual heuristics and biases, these types of studies were used to reconstruct the behavioural mechanisms underlying these practices.

Through the two strategies, it was possible to find some evidence explaining the potential effects of such practices on digital payment method choice. Nonetheless, further investigation on these factors is needed.

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<sup>430</sup> See for instance Tounekti et al, 2019; Alarooj, 2019; Deufel & Kemper, 2018.

## C.8 Literature review references

### Articles

- Ajzen, I. (1996). The social psychology of decision making. In: Higgins, E.T., & Kruglanski, A.W. (Eds.), *Social Psychology: Handbook of basic principles*, 297-325. Guilford Press, New York.
- Alarooj, N. (2019). Which factors influence consumers' choice of payment method when purchasing online?. Auckland University of Technology, Faculty of Business, Economics and Law - Department of Marketing.
- Arango, C., Huynh, K., & Sabetti, L. (2015). Consumer payment choice: Merchant card acceptance versus pricing incentives. *Journal of Banking & Finance*, 55, 130-141. <https://doi.org/10.1016/j.jbankfin.2015.02.005>.
- Ariely, D., Loewenstein, G., & Prelec, D. (2003). "Coherent arbitrariness": Stable demand curves without stable preferences. *The Quarterly Journal of Economics*, 118(1), 73 -106. <https://doi.org/10.1162/00335530360535153>.
- Casado-Aranda, L., Liebana-Cabanillas, F., & Sancez-Fernandez, J. (2018). A neuropsychological study on how consumers process risky and secure e-payments. *Journal of Interactive Marketing*, 43, 151-164. <https://doi.org/10.1016/j.intmar.2018.03.001>.
- Christain, T., Sengunthar, L., Christain, O., & Verma, S. (2018). Impact of Demographic Factors on Payment Method Chosen by Indian Consumers using ANOVA. *IJSRSET*, 4(1). National Conference on Advanced Research Trends in Information and Computing Technologies.
- Dale, S. (2015). Heuristics and biases: The science of decision-making. *Business Information Review*, 32(2), 93-99. <https://doi.org/10.1177/0266382115592536>.
- de Bruin, W., & Keren, G. (2003). Order effects in sequentially judged options due to the direction of comparison. *Organizational Behavior and Human Decision Processes*, 92, 91-101. doi:10.1016/S0749-5978(03)00080-3.
- Deloitte Service for Financial Payments. (2016). "Default" payment methods. DUP\_Default-payment-methods-digital-reset.pdf.
- Deufel, P., Kemper, J., & Brettel, M. (2019). Pay now or pay later: a cross-cultural perspective on online payments. *Journal of Electronic Commerce Research*, 20(3). [http://www.jecr.org/sites/default/files/2019vol20no3\\_Paper1.pdf](http://www.jecr.org/sites/default/files/2019vol20no3_Paper1.pdf).
- Dhingra, N., Gorn, Z., Kener, A., & Dana, J. (2012). The default pull: An experimental demonstration of subtle default effects on preferences. *Judgment and Decision Making*, 7(1), 69-76. doi:10.1017/S1930297500001844.
- Dixit, A., Hall, K., & Dutta, A. (2014). Psychological influences on customer willingness to pay and choice in automated retail settings Context effects, attribute framing, and perceptions of fairness. *American Journal of Business*, 29(3/4), 237-260. DOI 10.1108/AJB-06-2014-0036.
- El Haddad, G., & Aimeur, E. (2018). Understanding Trust, Privacy and Financial Fears in Online Payment. 17th IEEE International Conference On Trust, Security And Privacy In Computing And Communications/12th IEEE International Conference On Big Data Science And Engineering.
- Fryer Jr, R. G., Levitt, S. D., List, J., & Sadoff, S. (2012). Enhancing the efficacy of teacher incentives through loss aversion: A field experiment (No. w18237). National Bureau of Economic Research.

- Furnham, A., & Boo, H. (2010). A literature review of the anchoring effect. *The Journal of Socio-Economics*, 40(1), 35-42. <https://doi.org/10.1016/j.socec.2010.10.008>.
- Giuliani, F., Cannito, L., Gigliotti, G., Rosa, A., Pietroni, D., & Palumbo, R. (2022). The joint effect of framing and defaults on choice behaviour. *Psychological Research*, 87, 1114-1128. <https://doi.org/10.1007/s00426-022-01726-3>.
- Goldstein, A., Raphaelli, O., Reichman, S., (2016). Engagement, Search Goals and Conversion - The Different M-Commerce Path to Conversion. *ICIS 2016 Proceedings*.
- Hardisty, D., Appelt, K., & Weber, E. (2013). Good or Bad, We Want it Now: Fixed-cost Present Bias for Gains and Losses Explains Magnitude Asymmetries in Intertemporal Choice. *Journal of Behavioral Decision Making*, 26, 348-361. DOI: 10.1002/bdm.1771.
- Harsono, B. D. (2018). Consumer preference of choosing e-payment system for online shopping using conjoint analysis. *International Journal of Science and Research*, 8(2), 1333-1338. DOI: 10.21275/ART20195473.
- He, F., & Mykytyn, P. (2008). Decision factors of the adoption of e-finance and other e-commerce systems. *Americas Conference on Information Systems (AMICIS) 2008 Proceedings*. <http://aisel.aisnet.org/amcis2008/229>.
- Hirschman, E. C. (1979). Differences in consumer purchase behaviour by credit card payment system. *Journal of Consumer Research*, 6(1), 58-66. <https://doi.org/10.1086/208748>.
- Ho, H., & Awan, M. (2019). The Gender Effect on Consumer Attitudes Toward Payment Methods: The Case of Online Chinese Customers. *Journal of Internet Commerce*, 18 (2), p.141-169. DOI: 10.1080/15332861.2019.1584010.
- Hoa, N., Hien, L., & Lien, V. (2019). Studying the factors affecting online payment decision: a case of Vietnamese costumers. *Journal of Management Information and Decision Sciences*, 22(1). 1532-5806-22-1-124.
- Ipsos. (2015). Ipsos Study for Paypal Reveals Drivers and Barriers of Mobile Shopping around the World.
- Jain, N., Raman, T. V., & Bhardwaj, G. N. (2023). Do Behavioural Biases Drive Adoption of Digital Banking Services? The Moderating Role of User Type. *Global Business Review*, 0(0). <https://doi.org/10.1177/09721509231160865>.
- Johnson, E., Bellman, S., & Lohse, G. (2001). Defaults, framing and privacy: why opting in-opting out. *Marketing Letters* 13, 5-15. <https://doi.org/10.1023/A:1015044207315>.
- Johnson, E., Shu, S., Dellaert, B., Fox, C., Goldstein, D., Häubl, G., Larrick, R., Payne, J., Peters, E., Schkade, D., Wansink, B., & Weber, E. (2012). Beyond nudges: Tools of a choice architecture. *Marketing Letters*, 23, 487-504. <https://link.springer.com/article/10.1007/s11002-012-9186-1>.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: an analysis of decision under risk. *Econometrica*, 47(2). [https://www.jstor.org/stable/pdf/1914185.pdf?refreqid=fastly-default%3Ab05a48a94447c755fb8bccdd9ccaed5c&ab\\_segments=&origin=&initiator=&acceptTC=1](https://www.jstor.org/stable/pdf/1914185.pdf?refreqid=fastly-default%3Ab05a48a94447c755fb8bccdd9ccaed5c&ab_segments=&origin=&initiator=&acceptTC=1).
- Kahneman, D., Knetsch, J., & Thaler, R. (1991). Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias. *Journal of Economic Perspectives*, 5(1), 193- 206.
- Kemper, J., & Deufel, P. (2018). Show me how you buy and I will tell you how you pay: The situational effect on payment method choice in e-commerce. *Conference Paper – ECIS 2018 Proceedings*.

- Kirchler, E., Maciejovsky, B., & Weber, M. (2005). Framing Effects, Selective Information and Market Behavior: An Experimental Analysis. *Journal of Behavioral Finance*, 6(2), 90-100. [https://psycnet.apa.org/doi/10.1207/s15427579jpfm0602\\_4](https://psycnet.apa.org/doi/10.1207/s15427579jpfm0602_4).
- Kivetz, R., & Simonson, I. (2000). The effects of incomplete information on consumer choice. *Journal of Marketing Research*, 37(4), 427-448. <https://doi.org/10.1509/jmkr.37.4.427.18796>.
- Köcher, S., Jugovac, M., Jannach, D., & Holzmüller, H. (2019). New Hidden Persuaders: An Investigation of Attribute-Level Anchoring Effects of Product Recommendations. *Journal of Retailing*, 95(1), 24-41. <https://doi.org/10.1016/j.jretai.2018.10.004>.
- Korteling, J.E., & Toet, A. (2022). Cognitive biases. *Encyclopedia of Behavioral Neuroscience*, Second Edition, 610-619. <https://doi.org/10.1016/B978-0-12-809324-5.24105-9>.
- Kosse, A., & Jansen, D. (2011). Choosing how to pay: the influence of home country habits. *De Nederlandsche Bank Working Paper N. 328/2011*. [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1977192](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1977192).
- Köster, A., Matt, C., & Hess, T. (2016). Carefully choose your (payment) partner: How payment provider reputation influences m-commerce transactions. *Electronic Commerce Research and Applications*, 15, 26-37. <https://doi.org/10.1016/j.elerap.2015.11.002>.
- Liebana-Cabanillas, F., Kalinic, Z., Munoz-Leiva, F., & Higuera-Castillo, E. (2024). Biometric m-payment systems: A multi-analytical approach to determining use intention. *Information & Management*, 61(2). <https://doi.org/10.1016/j.im.2023.103907>.
- Lipari, F. (2018). This Is How We Do It: How Social Norms and Social Identity Shape Decision Making under Uncertainty. *Games*, 9(4), 99. <https://doi.org/10.3390/g9040099>.
- Loh, X-M., Lee, V-H., Tan, G., Ooi, K-B., & Dwivedi, Y.K. (2021). Switching from cash to mobile payment: what's the hold-up?. *Internet Research*, 31(1), 376-399. <https://doi.org/10.1108/INTR-04-2020-0175>.
- Lohana, S., & Roy, D. (2023). Impact of Demographic Factors on Consumer's Usage of Digital Payments. *FIIB Business Review*, 12(4), 351-473. <https://doi.org/10.1177/23197145211049586>.
- Lysik, L., Kutera, R., Machura, P. (2014). Behavioural and technical factors of influence on purchase behaviour of mobile consumers. *Proceedings of the 18th International Academic MindTrek Conference on Media*.
- Martinez, B, & Mc Andrews, L. (2022). Do you take...? The effect of mobile payment solutions on use intention: an application of UTAUT2. *Journal of Marketing Analytics*, 11, 458-469. <https://doi.org/10.1057/s41270-022-00175-6>
- Melnyk, V., van Herpen, E., Jak, S., & van Trijp, H. (2019). The Mechanisms of Social Norms' Influence on Consumer Decision Making. A Meta Analysis. *Zeitschrift für Psychologie*, 227(1). <https://doi.org/10.1027/2151-2604/a000352>.
- Milutinovic, G., Ahonen-Jonnarth, U., & Seipel, S. (2021). Does visual saliency affect decision-making?. *Journal of Visualization*, 24, 1267-1285. <https://doi.org/10.1007/s12650-021-00760-4>.
- Mograbi, E. (2022). Decision-makers are more impulsive on smartphones than on computers. *Journal of Behavioral and Experimental Economics*, 100. <https://doi.org/10.1016/j.socrec.2022.101916>.

- Münscher, R., Vetter, M., & Scheuerle, T. (2016). A review and taxonomy of choice architecture techniques. *Journal of Behavioral Decision Making*, 29, 511–524. DOI:10.1002/bdm.1897.
- Neal, D. T., Wood, W., & Quinn, J. M. (2006). Habits—A Repeat Performance. *Current Directions in Psychological Science*, 15(4), 198–202. <https://doi.org/10.1111/j.1467-8721.2006.00435.x>.
- Ngai, E.W.T., Gunasekaran, A., 2007. A review for mobile commerce research and applications. *Decis. Support Syst.* 43, 3–15. <https://doi.org/10.1016/j.dss.2005.05.003>.
- Nur, T., & Panggabean, R. (2021). Factors Influencing the Adoption of Mobile Payment Method among Generation Z: the Extended UTAUT Approach. *Journal of Accounting Research, Organization and Economics*, 4(1), 4–28.
- Ouellette, J. A., & Wood, W. (1998). Habit and intention in everyday life: The multiple processes by which past behavior predicts future behavior. *Psychological Bulletin*, 124(1), 54–74. <https://doi.org/10.1037/0033-2909.124.1.54>.
- Ozkan, S., Bindusara, G., & Hackney, R. (2010). Facilitating the adoption of e-payment systems: theoretical constructs and empirical analysis. *Journal of Enterprise Information Management*, 23(3), 305–325. <https://doi.org/10.1108/17410391011036085>.
- Polites, G. I., & Karahanna, E. (2012). Shackled to the Status Quo: The Inhibiting Effects of Incumbent System Habit, Switching Costs, and Inertia on New System Acceptance. *MIS Quarterly*, 36(1), 21–42. <https://www.jstor.org/stable/41410404>.
- Rajagopal, N., Ramkumar, G., Yousoof, M., Tripathi, A., & Kakade, K. (2022). Neuropsychological study of how shoppers handle dubious transactions and make online payments. *Journal of Contemporary Issues in Business and Government*, 28(4). DOI: 10.47750/cibg.2022.28.04.049.
- Raphaeli, O., Goldstein, A., Fink, L., 2017. Analyzing online consumer behavior in mobile and PC devices: a novel web usage mining approach. *ECRA* 26, 1–12. <https://doi.org/10.1016/j.elerap.2017.09.003>.
- Reb, J. (2008). Regret aversion and decision process quality: Effects of regret salience on decision process carefulness. *Organizational Behavior and Human Decision Processes*, 105, 169–182.
- Reshadi, F., & Fitzgerald, P. (2023). The pain of payment: A review and research agenda. *Psychology & Marketing*, 40(2), 1672–1688. DOI: 10.1002/mar.21825.
- Roetzel, P. G. (2019). Information overload in the information age: a review of the literature from business administration, business psychology, and related disciplines with a bibliometric approach and framework development. *Business Research*, 12, 479–522. <https://doi.org/10.1007/s40685-018-0069-z>.
- Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Giskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological Science*, 18(5), 429–434. <https://doi.org/10.1111/j.1467-9280.2007.01917.x>.
- See-To, E., Papagiannidis, S., & Westland, C. (2014). The moderating role of income on consumers' preferences and usage for online and offline payment methods. *Electron Commer Res*, 14, 89–213. DOI 10.1007/s10660-014-9138-3.
- Senecal S., & Nantel, J. (2004). The influence of online product recommendations on consumers' online choices. *Journal of Retailing*, 80(2), 159–169. <https://doi.org/10.1016/j.jretai.2004.04.001>.

Shaw, B., & Kesharwani, A. (2019). Moderating Effect of Smartphone Addiction on Mobile Wallet Payment Adoption. *Journal of Internet Commerce*, 18(3), 291-319. <https://doi.org/10.1080/15332861.2019.1620045>.

Stavins, J. (2017). How do consumers make their payment choices? Research Data Reports Paper, (17-1). <https://ssrn.com/abstract=2995875>.

Stavins, J. (2018). Consumer preferences for payment methods: Role of discounts and surcharges. *Journal of banking and Finance*, 94, 35-53. <https://doi.org/10.1016/j.jbankfin.2018.06.013>.

Swiecka, B., Terefenko, P., & Paprotny, D. (2021). Transaction factors' influence on the choice of payment by Polish consumers. *Journal of Retailing and Consumer Services*, 58. <https://doi.org/10.1016/j.jretconser.2020.102264>.

Tan, W., Tan, C., & Teo, H. (2012). Consumer-based decision aid that explains which to buy: Decision confirmation or overconfidence bias?. *Decision Support Systems*, 53(1) 127-141. <https://doi.org/10.1016/j.dss.2011.12.010>.

TNS Infratest (2013). Study on the effects of information disclosure on consumer choice of payment instruments. 955e7670-852e-47e2-9c92-bc2c26c70e9f\_en (europa eu).

Tounekti, O., Ruiz-Martínez, A., & Skarmeta Gómez, A. F. (2019). Users Supporting Multiple (Mobile) Electronic Payment Systems in Online Purchases: An Empirical Study of Their Payment Transaction Preferences. *IEEE Access*, 8, 735-766. doi: <https://doi.org/10.1109/ACCESS.2019.2961785>.

Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, 211(4481), 453-458. doi: 10.1126/science.7455683.

Uldall, B.R. (2013). Social Psychology. In: Runehov, A.L., & Oviedo, L. (eds), *Encyclopedia of Sciences and Religions*. Springer, Dordrecht. [https://doi.org/10.1007/978-1-4020-8265-8\\_1047](https://doi.org/10.1007/978-1-4020-8265-8_1047).

van der Cruysen, C., & van der Horst, F. (2016). Payment behaviour: the role of socio-psychological factors. De Nederlandsche Bank Working Paper 532/2016.

Verplanken, B., & van Knippenberg, A. (2006). Predicting Behavior From Actions in the Past: Repeated Decision Making or a Matter of Habit? *Journal of Applied Psychology*, 28(15), 1355-1374. <https://doi.org/10.1111/j.1559-1816.1998.tb01681.x>.

Vinitha, K. (2017). Influence of demographic variables on usage of e-payment system. *International Journal of Mechanical Engineering and Technology*, 8(11), 265-276. <http://www.iaeme.com/IJMET/issues.asp?JType=IJMET&VType=8&IType=11>.

Wilmer, H., & Chein, J. (2016). Mobile technology habits: patterns of association among device usage, intertemporal preference, impulse control, and reward sensitivity. *Psychonomic Bulletin & Review*, 23, 1607-1614. <https://doi.org/10.3758/s13423-016-1011-z>.

Xu, Q., & Riedl, R. (2011). Understanding Online Payment Method Choice: An Eye-tracking Study. *ICIS 2011 Proceedings*, 18. <https://aisel.aisnet.org/icis2011/proceedings/humanbehavior/18/>.

Yilmaz, E. S. (2022). QR codes and e-wallet applications in digital era. How do they influence the digital marketing strategies?. *Digital Transformation: A Human-Centric Approach*, 91.

Zeeshan, Z.M. (2013). The impact of mobile service attributes on males' and females' purchase decision. *Management and Marketing*, 8(4), 669-682. <https://www.managementmarketing.ro/pdf/articole/332.pdf>.

Zhang, J. & Mao, E. (2019). Cash, credit, or phone? An empirical study on the adoption of mobile payments in the United States. *Psychology and Marketing*, 37(1). <https://doi.org/10.1002/mar.21282>.

### **Websites**

[Apple Pay | Apple Developer Documentation](#).

## **D. Annex D**

**See separate document:**

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## E. Annex E

Annex E includes the definition of segments used in the analysis of chapter 2

Initially a variable is created that counts how many payment options are owned by each respondent. This is provided by the question E5: Which of the following payment methods do you have and have used to make online purchases?

A secondary variable is created for those that identified owning a debit or credit card to understand how many card options they own. This is provided by the question E6: You've indicated owning a credit and/or debit card. Please specify which of the following credit or debit card you own. The card options are clustered such that the variable only considers how many types of cards you own. This is shown in the below table:

**Table E.1: Credit/debit card type clustering**

<b>Visa, Mastercard, AMEX, Discover, JCB, Diner's Club</b>
Maestro, V Pay, Visa Electron, PIN, Dankort
Girocard
Bancomat
Postgirot, Bankgirot
Servired, Sistema 4B, EURO 6000
Cartes Bancaires

*Source: Project Team*

The number of payment methods variable is then adjusted with however many card options is owned to increase the number owned.

A further variable is created that counts how many payment methods are used frequently. This is provided by selecting how many payment options are answered with either a 4 or 5 (Frequently or Almost always) for question E5a: You mentioned you own the following payment methods. Please indicate how frequently you use each method.

Using these two variables we can produce the segmentation as follows:

**Table E.2: Segment/persona definitions**

<b>Segment/persona</b>	<b>Definition</b>
Segment 0: Non-frequent online buyers	Respondents who own more than 1 payment method, but do not use any frequently
Segment 1: Never-switchers with no capacity	Respondents who own only one payment method
Segment 2: Never-switchers by choice	Respondents who own more than 1 payment method, but only use one frequently
Segment 3: Dual-switchers	Respondents who own more than 1 payment method and use two frequently
Segment 4: Multi-switchers	Respondents who own more than 2 payment method and use more than two frequently

*Source: Project Team based on consumer survey*

## F. Annex F

Annex F includes the regression tables used for the analysis of chapter 2.

**Table F.1: Segmentation model output - Full model**

<b>Segmentation (Logistic)</b>					
	<b>Segment 0: Non-frequent online buyers</b>	<b>Segment 1: Never-switchers with no capacity</b>	<b>Segment 2: Never-switchers by choice</b>	<b>Segment 3: Dual-switchers</b>	<b>Segment 4: Multi-switchers</b>
Gender: Woman	-0.106 (0.084)	0.056 (0.171)	0.031 (0.046)	-0.069 (0.046)	0.098 (0.067)
Gender: Other	0.234 (0.907)	3.075 (6.887)	0.271 (0.522)	0.301 (0.490)	-1.140 (0.795)
Age: 25-39	0.273 (0.179)	-0.185 (0.349)	0.027 (0.093)	-0.223*** (0.082)	-0.052 (0.107)
Age: 40-54	0.578*** (0.172)	-0.484 (0.334)	0.110 (0.091)	-0.333*** (0.083)	-0.109 (0.111)
Age: 55-64	0.452** (0.176)	-0.390 (0.340)	0.184** (0.092)	-0.376*** (0.086)	-0.282** (0.122)
Age: 65+	0.466*** (0.176)	-0.639* (0.335)	0.216** (0.092)	-0.372*** (0.086)	-0.331*** (0.125)
Education: Medium	-0.071 (0.125)	-0.049 (0.267)	0.011 (0.076)	0.154* (0.081)	0.023 (0.121)
Education: High	0.006 (0.132)	-0.281 (0.279)	-0.126 (0.079)	0.152* (0.083)	0.232* (0.123)
Income: From time to time	-0.165 (0.157)	-0.536 (0.371)	-0.192** (0.094)	0.155* (0.091)	-0.084 (0.118)
Income: Almost never/Never	-0.098 (0.155)	-0.443 (0.370)	-0.045 (0.091)	0.069 (0.089)	-0.202* (0.116)
Country: Czechia	0.461** (0.207)	0.011 (0.490)	-0.068 (0.122)	-0.047 (0.122)	0.373* (0.190)
Country: Germany	-0.060 (0.213)	0.450 (0.751)	-0.115 (0.118)	-0.157 (0.120)	0.151 (0.197)
Country: Denmark	0.522** (0.252)	-1.213** (0.522)	0.235 (0.151)	0.012 (0.151)	0.220 (0.230)
Country: Greece	-0.667*** (0.258)	1.092* (0.565)	-0.153 (0.126)	0.095 (0.124)	0.470** (0.195)
Country: Spain	-0.740*** (0.254)	2.069*** (0.724)	-0.169 (0.121)	-0.099 (0.121)	0.523*** (0.191)
Country: France	-0.409* (0.238)	1.407** (0.546)	-0.135 (0.123)	-0.243* (0.128)	0.046 (0.219)
Country: Hungary	0.854*** (0.204)	1.153** (0.553)	-0.065 (0.128)	-0.479*** (0.134)	0.252 (0.204)
Country: Italy	0.021 (0.223)	-0.333 (0.491)	-0.235* (0.123)	-0.109 (0.122)	0.735*** (0.196)

Country: Latvia	-0.300 (0.233)	0.482 (0.482)	-0.325** (0.129)	0.098 (0.126)	0.672*** (0.196)
Country: Netherlands	-0.292 (0.224)	1.249** (0.515)	-0.024 (0.119)	-0.116 (0.122)	0.126 (0.198)
Country: Poland	-0.838*** (0.265)	-0.034 (0.479)	-0.639*** (0.128)	-0.123 (0.123)	1.703*** (0.181)
Country: Portugal	-0.859** (0.371)	1.220* (0.708)	-0.726*** (0.179)	0.252 (0.162)	0.771*** (0.258)
Country: Sweden	0.223 (0.207)	-0.609 (0.509)	-0.073 (0.117)	-0.308** (0.120)	0.969*** (0.175)
Financial Literacy Index	-0.195 (0.147)	0.007 (0.284)	0.440*** (0.089)	-0.093 (0.084)	-0.243** (0.116)
Digital Skills Index	0.147 (0.192)	-0.638* (0.383)	0.062 (0.106)	0.028 (0.106)	0.005 (0.153)
Trust in Online Platforms	0.023 (0.022)	-0.031 (0.041)	-0.009 (0.012)	-0.003 (0.012)	0.009 (0.018)
Trust in Payment Methods	-0.081*** (0.022)	-0.008 (0.041)	0.035*** (0.012)	0.017 (0.013)	0.023 (0.018)
Trust in Consumer Protection	0.001 (0.017)	0.015 (0.032)	-0.021** (0.009)	0.009 (0.009)	0.018 (0.013)
Novelties: I am open to trying new things but do not actively seek them out	-0.156 (0.148)	-0.537 (0.338)	0.288*** (0.082)	0.199*** (0.072)	-0.385*** (0.090)
Novelties: I prefer to wait until new things have been tested by others before trying them	-0.009 (0.148)	-0.427 (0.341)	0.358*** (0.083)	0.136* (0.075)	-0.529*** (0.097)
Novelties: I rarely try new things and prefer to stick with what I know	-0.025 (0.167)	-0.253 (0.368)	0.371*** (0.096)	-0.049 (0.093)	-0.610*** (0.136)
Novelties: I avoid trying new things altogether	-0.514* (0.277)	-0.085 (0.508)	0.113 (0.154)	-0.273 (0.174)	-0.260 (0.278)
Online Payment Frequency: Approximately once a month	-0.839*** (0.100)	-0.889*** (0.205)	0.221*** (0.061)	0.434*** (0.068)	0.271** (0.115)
Online Payment Frequency: 2-3 times a month	-1.044*** (0.109)	-0.625*** (0.242)	-0.035 (0.064)	0.604*** (0.069)	0.664*** (0.110)
Online Payment Frequency: Once a week	-1.590*** (0.197)	-0.531 (0.380)	-0.459*** (0.094)	0.613*** (0.088)	0.901*** (0.128)
Online Payment Frequency: More than once a week	-2.021*** (0.274)	-0.351 (0.457)	-0.627*** (0.115)	0.354*** (0.101)	1.386*** (0.135)

Payment Option Owned: International cards	-0.164* (0.089)	-16.190*** (1.817)	0.229*** (0.051)	0.419*** (0.052)	1.086*** (0.078)
Payment Option Owned: Domestic cards	-0.073 (0.385)	-13.030*** (2.950)	-0.070 (0.177)	0.035 (0.155)	1.264*** (0.229)
Payment Option Owned: Paypal	0.577*** (0.093)	-11.869*** (1.449)	0.410*** (0.051)	0.468*** (0.052)	0.846*** (0.081)
Payment Option Owned: Big Tech wallets	-0.524*** (0.111)	-15.630*** (1.857)	-0.471*** (0.058)	0.065 (0.054)	1.445*** (0.070)
Payment Option Owned: Online banking	0.432*** (0.103)	-17.098*** (1.824)	0.385*** (0.056)	0.437*** (0.057)	1.476*** (0.099)
Payment Option Owned: Buy now pay later	0.039 (0.127)	-12.161*** (1.795)	0.085 (0.068)	0.105 (0.066)	0.649*** (0.090)
Payment Option Owned: Other digital wallets	-0.246 (0.188)	-11.346*** (2.527)	-0.278** (0.118)	0.069 (0.115)	1.082*** (0.152)
Payment Option Owned: Other	0.894*** (0.153)	-12.441*** (2.337)	-0.092 (0.108)	-0.422*** (0.106)	0.398*** (0.130)
G8: Index of Negative Payment Experiences	0.111* (0.061)	-0.175 (0.113)	-0.069* (0.039)	-0.091** (0.036)	0.194*** (0.045)
GX: Index of How Often Framing Techniques Noticed	-0.112** (0.046)	-0.188** (0.083)	-0.129*** (0.025)	0.001 (0.025)	0.273*** (0.037)
G6: I have my preferred payment methods and I always select one of them	-0.088*** (0.024)	-0.066 (0.057)	0.012 (0.015)	0.002 (0.015)	0.035 (0.022)
G6: I typically don't give much thought to the payment methods.	0.018 (0.014)	0.014 (0.027)	-0.004 (0.008)	0.007 (0.008)	-0.037*** (0.011)
G6: If there is the option to select my payment method early in the checkout process, for example immediately at the product page, I do so	-0.007 (0.016)	0.025 (0.032)	-0.016* (0.008)	0.021** (0.009)	-0.018 (0.013)
G6: If a payment method is pre-selected for me at the check-out, I usually stick with that method	0.030* (0.017)	0.043 (0.033)	-0.027*** (0.009)	-0.004 (0.009)	0.035** (0.014)

G6: When a preferred payment method is highlighted or suggested based on my past usage on a platform or app, I tend to choose that option	-0.043** (0.017)	-0.030 (0.033)	0.030*** (0.009)	-0.003 (0.009)	-0.001 (0.014)
G6: I do not explore other payment options if they are not immediately visible and require a 'show more' button to see	0.012 (0.015)	-0.049* (0.029)	0.006 (0.008)	-0.029*** (0.008)	0.020 (0.012)
G7: Seamless transactions (e.g., preferred payment methods are saved, no additional logins needed)	-0.001 (0.017)	0.061* (0.034)	-0.012 (0.009)	0.008 (0.010)	-0.002 (0.015)
G7: Security features (e.g., encryption, fraud protection)	-0.043 (0.029)	-0.039 (0.061)	-0.014 (0.017)	0.040** (0.017)	-0.020 (0.025)
G7: Convenience of use (e.g., ease of setup, user interface)	0.045 (0.028)	-0.069 (0.056)	0.001 (0.015)	-0.008 (0.016)	-0.024 (0.023)
G7: Reputation of the provider	-0.028 (0.028)	0.036 (0.062)	0.025 (0.017)	-0.029* (0.017)	0.013 (0.025)
G7: Ease of monitoring and managing expenses	0.033 (0.028)	0.086 (0.059)	-0.016 (0.015)	-0.014 (0.016)	0.051** (0.024)
G7: Acceptance by merchants (how widely it is accepted online)	-0.044 (0.027)	-0.037 (0.060)	-0.006 (0.016)	0.012 (0.016)	-0.006 (0.023)
G7: Lack of direct transaction fees and other costs for me	-0.028 (0.027)	0.011 (0.057)	0.019 (0.016)	0.008 (0.016)	-0.032 (0.024)
G7: Additional benefits or rewards (e.g., cashback, loyalty points from the payment method)	-0.005 (0.019)	0.008 (0.040)	-0.008 (0.010)	0.005 (0.011)	0.019 (0.017)
G7: Usage by people I know	0.019 (0.016)	-0.050 (0.034)	-0.007 (0.009)	-0.001 (0.009)	0.006 (0.013)
G7: Possibility to pay in instalments	-0.008 (0.020)	0.044 (0.038)	0.007 (0.011)	-0.007 (0.011)	0.017 (0.016)

G7: Ability to 'buy now, pay later'	-0.020 (0.019)	-0.026 (0.036)	-0.024** (0.010)	-0.0003 (0.010)	0.054*** (0.015)
Constant	-0.382 (0.403)	21.516*** (2.064)	-1.401*** (0.248)	-2.398*** (0.245)	-7.679*** (0.374)
N	10800	10800	10800	10800	10800
Log Likelihood	-2515.584	-568.163	-6520.269	-6609.310	-3562.235
AIC	5159.169	1264.327	13168.540	13346.620	7252.469
***p < .01; **p < .05; *p < .1					

Source: Consumer survey

Table F.2: Segmentation model output - Partial model

Segmentation Partial Model (Logistic)					
	Segment 0: Non- frequent online buyers	Segment 1: Never- switchers with no capacity	Segment 2: Never- switchers by choice	Segment 3: Dual- switchers	Segment 4: Multi- switchers
Gender: Woman	-0.058 (0.076)	0.286*** (0.050)	0.036 (0.042)	-0.120*** (0.043)	-0.188*** (0.052)
Gender: Other	0.230 (0.887)	-0.345 (0.770)	0.404 (0.503)	0.287 (0.475)	-1.049 (0.717)
Age: 25-39	0.130 (0.169)	-0.292*** (0.099)	0.123 (0.088)	-0.088 (0.077)	0.105 (0.085)
Age: 40-54	0.526*** (0.159)	-0.093 (0.095)	0.388*** (0.085)	-0.206*** (0.077)	-0.294*** (0.087)
Age: 55-64	0.584*** (0.158)	0.103 (0.093)	0.652*** (0.084)	-0.303*** (0.077)	-0.797*** (0.093)
Age: 65+	0.639*** (0.154)	0.381*** (0.088)	0.765*** (0.081)	-0.442*** (0.074)	-1.301*** (0.095)
Education: Medium	-0.202* (0.115)	-0.416*** (0.078)	0.066 (0.071)	0.268*** (0.077)	0.202** (0.099)
Education: High	-0.292** (0.120)	-0.719*** (0.082)	-0.092 (0.074)	0.364*** (0.078)	0.655*** (0.099)
Income: From time to time	-0.208 (0.145)	0.053 (0.097)	-0.085 (0.087)	0.273*** (0.086)	-0.216** (0.092)
Income: Almost never/Never	-0.281** (0.137)	-0.145 (0.093)	0.209** (0.082)	0.275*** (0.082)	-0.415*** (0.087)
Country: Czechia	0.312* (0.178)	0.369** (0.151)	-0.286*** (0.107)	-0.245** (0.110)	0.428*** (0.152)
Country: Germany	-0.144 (0.193)	0.449*** (0.148)	-0.263** (0.107)	-0.189* (0.109)	0.494*** (0.150)
Country: Denmark	0.215 (0.181)	-0.185 (0.166)	-0.159 (0.107)	-0.123 (0.109)	0.562*** (0.148)
Country: Greece	-0.695*** (0.228)	0.815*** (0.147)	-0.355*** (0.112)	-0.044 (0.110)	0.212 (0.153)

Country: Spain	-0.696*** (0.223)	0.903*** (0.142)	-0.327*** (0.106)	-0.243** (0.107)	0.361** (0.148)
Country: France	-0.528** (0.214)	1.601*** (0.136)	-0.389*** (0.109)	-0.601*** (0.115)	-0.456*** (0.174)
Country: Hungary	0.770*** (0.167)	0.507*** (0.149)	-0.322*** (0.108)	-0.556*** (0.115)	0.416*** (0.150)
Country: Italy	-0.218 (0.197)	0.951*** (0.141)	-0.488*** (0.109)	-0.277** (0.110)	0.373** (0.152)
Country: Latvia	-0.175 (0.199)	0.962*** (0.143)	-0.460*** (0.111)	-0.183* (0.109)	0.241 (0.151)
Country: Netherlands	-0.241 (0.200)	0.781*** (0.144)	-0.076 (0.105)	-0.353*** (0.111)	0.014 (0.159)
Country: Poland	-0.878*** (0.240)	0.380** (0.152)	-0.733*** (0.113)	-0.203* (0.109)	1.298*** (0.138)
Country: Portugal	-0.893*** (0.241)	0.353** (0.154)	-0.735*** (0.115)	0.105 (0.106)	0.914*** (0.142)
Country: Sweden	0.107 (0.185)	-0.235 (0.169)	-0.189* (0.107)	-0.354*** (0.111)	0.946*** (0.142)
Constant	-2.472*** (0.238)	-1.769*** (0.169)	-1.157*** (0.137)	-0.936*** (0.136)	-1.531*** (0.170)
N	11269	11269	11269	11269	11269
Log Likelihood	-2886.103	-5460.955	-7165.307	-7188.825	-5224.343
AIC	5820.206	10969.910	14378.610	14425.650	10496.690

\*\*\*p < .01; \*\*p < .05; \*p < .1

Source: Consumer survey

Table F.3: Experiment model output - Outcome 1 model

Experiment - Outcome 1 (Logistic)				
	Extended Model - Upstreaming as Treatment Baseline	Extended Model - Default as Treatment Baseline	Extended Model - Show-more as Treatment Baseline	Model - Sociodemographic
Gender: Woman	-0.114** (0.051)	-0.114** (0.051)	-0.114** (0.051)	-0.125*** (0.039)
Gender: Other	0.948 (0.587)	0.948 (0.587)	0.948 (0.587)	0.785* (0.475)
Age: 25-39	-0.205** (0.091)	-0.205** (0.091)	-0.205** (0.091)	-0.148** (0.072)
Age: 40-54	-0.117 (0.091)	-0.117 (0.091)	-0.117 (0.091)	-0.183*** (0.071)
Age: 55-64	-0.115 (0.094)	-0.115 (0.094)	-0.115 (0.094)	-0.295*** (0.071)
Age: 65+	0.013 (0.092)	0.013 (0.092)	0.013 (0.092)	-0.322*** (0.069)

Education: Medium	-0.148* (0.083)	-0.148* (0.083)	-0.148* (0.083)	-0.025 (0.066)
Education: High	-0.106 (0.087)	-0.106 (0.087)	-0.106 (0.087)	0.016 (0.067)
Income: From time to time	-0.144 (0.094)	-0.144 (0.094)	-0.144 (0.094)	-0.195*** (0.074)
Income: Almost never/Never	-0.271*** (0.090)	-0.271*** (0.090)	-0.271*** (0.090)	-0.305*** (0.071)
Country: Czechia	-0.220 (0.139)	-0.220 (0.139)	-0.220 (0.139)	-0.054 (0.104)
Country: Germany	0.039 (0.133)	0.039 (0.133)	0.039 (0.133)	0.173* (0.101)
Country: Denmark	-0.189 (0.158)	-0.189 (0.158)	-0.189 (0.158)	0.050 (0.103)
Country: Greece	0.107 (0.141)	0.107 (0.141)	0.107 (0.141)	-0.104 (0.106)
Country: Spain	0.260* (0.135)	0.260* (0.135)	0.260* (0.135)	0.068 (0.101)
Country: France	0.353*** (0.137)	0.353*** (0.137)	0.353*** (0.137)	-0.080 (0.102)
Country: Hungary	0.126 (0.137)	0.126 (0.137)	0.126 (0.137)	0.155 (0.103)
Country: Italy	0.272** (0.135)	0.272** (0.135)	0.272** (0.135)	0.077 (0.101)
Country: Latvia	0.281** (0.135)	0.281** (0.135)	0.281** (0.135)	0.178* (0.103)
Country: Netherlands	0.232* (0.135)	0.232* (0.135)	0.232* (0.135)	0.243** (0.101)
Country: Poland	0.262* (0.140)	0.262* (0.140)	0.262* (0.140)	0.374*** (0.102)
Country: Portugal	0.119 (0.138)	0.119 (0.138)	0.119 (0.138)	0.089 (0.102)
Country: Sweden	0.063 (0.134)	0.063 (0.134)	0.063 (0.134)	0.230** (0.102)
Treatment: Default	0.471** (0.231)		-2.616*** (0.234)	
Treatment: Upstreaming		-0.471** (0.231)	-3.086*** (0.245)	
Treatment: Show-More	3.086*** (0.245)	2.616*** (0.234)		
Order: Toaster-Fridge	-0.248*** (0.086)	-0.177** (0.084)	0.011 (0.085)	
Payment Option Selected in Task 1: Paypal	0.305*** (0.075)	0.305*** (0.075)	0.305*** (0.075)	
Payment Option Selected in Task 1: Big Tech wallets	0.008 (0.108)	0.008 (0.108)	0.008 (0.108)	

Payment Option Selected in Task 1: Online banking	-0.114 (0.078)	-0.114 (0.078)	-0.114 (0.078)
Payment Option Selected in Task 1: Buy now pay later	-0.089 (0.110)	-0.089 (0.110)	-0.089 (0.110)
Payment Option Selected in Task 1: Other digital wallets	-0.062 (0.170)	-0.062 (0.170)	-0.062 (0.170)
Payment Option Selected in Task 1: Other	0.290 (0.353)	0.290 (0.353)	0.290 (0.353)
Payment Option Selected in Task 2: Paypal	0.072 (0.079)	0.072 (0.079)	0.072 (0.079)
Payment Option Selected in Task 2: Big Tech wallets	1.188*** (0.104)	1.188*** (0.104)	1.188*** (0.104)
Payment Option Selected in Task 2: Online banking	1.111*** (0.074)	1.111*** (0.074)	1.111*** (0.074)
Payment Option Selected in Task 2: Buy now pay later	1.135*** (0.108)	1.135*** (0.108)	1.135*** (0.108)
Payment Option Selected in Task 2: Other digital wallets	1.420*** (0.155)	1.420*** (0.155)	1.420*** (0.155)
Payment Option Selected in Task 2: Other	1.687*** (0.271)	1.687*** (0.271)	1.687*** (0.271)
Financial Literacy Index	-0.296*** (0.088)	-0.296*** (0.088)	-0.296*** (0.088)
Digital Skills Index	-0.318*** (0.115)	-0.318*** (0.115)	-0.318*** (0.115)
Trust in Online Platforms	-0.022* (0.013)	-0.022* (0.013)	-0.022* (0.013)
Trust in Payment Methods	0.013 (0.013)	0.013 (0.013)	0.013 (0.013)
Trust in Consumer Protection	0.046*** (0.010)	0.046*** (0.010)	0.046*** (0.010)
Segment 1: Never-switchers with no capacity	-0.527*** (0.203)	-0.975*** (0.190)	-1.910*** (0.190)
Segment 2: Never-switchers by choice	-0.030 (0.184)	-0.248 (0.168)	-0.226 (0.186)
Segment 3: Dual-switchers	0.227 (0.181)	-0.143 (0.168)	0.138 (0.192)
Segment 4: Multi-switchers	0.338* (0.189)	-0.506*** (0.183)	0.391* (0.213)
Preferred device: Smartphone	0.021 (0.057)	0.021 (0.057)	0.021 (0.057)
Preferred device: Tablet	-0.066 (0.068)	-0.066 (0.068)	-0.066 (0.068)
Preferred device: Laptop	-0.071 (0.053)	-0.071 (0.053)	-0.071 (0.053)
Preferred device: Desktop PC	-0.067 (0.059)	-0.067 (0.059)	-0.067 (0.059)

F4: I would feel confident my personal information was secure during the checkout process	-0.044*** (0.015)	-0.044*** (0.015)	-0.044*** (0.015)	
F4: I would have concerns about the safety of my financial information	-0.013 (0.013)	-0.013 (0.013)	-0.013 (0.013)	
F4: I would have trusted the website would protect my payment details	-0.024* (0.014)	-0.024* (0.014)	-0.024* (0.014)	
F4: I would have concerns about potential fraud	0.006 (0.013)	0.006 (0.013)	0.006 (0.013)	
Platform Feature Preferences Index	0.171*** (0.032)	0.171*** (0.032)	0.171*** (0.032)	
Interaction: Default/Order	0.071 (0.120)		-0.188 (0.119)	
Interaction: Upstreaming/Order		-0.071 (0.120)	-0.259** (0.120)	
Interaction: Show-more/Order	0.259** (0.120)	0.188 (0.119)		
Interaction: Default/Segment 1	-0.449 (0.277)		0.935*** (0.267)	
Interaction: Upstreaming/Segment 1		0.449 (0.277)	1.383*** (0.276)	
Interaction: Show-more/Segment 1	-1.383*** (0.276)	-0.935*** (0.267)		
Interaction: Default/Segment 2	-0.219 (0.249)		-0.023 (0.249)	
Interaction: Upstreaming/Segment 2		0.219 (0.249)	0.196 (0.261)	
Interaction: Show-more/Segment 2	-0.196 (0.261)	0.023 (0.249)		
Interaction: Default/Segment 3	-0.370 (0.245)		-0.281 (0.253)	
Interaction: Upstreaming/Segment 3		0.370 (0.245)	0.089 (0.262)	
Interaction: Show-more/Segment 3	-0.089 (0.262)	0.281 (0.253)		
Interaction: Default/Segment 4	-0.845*** (0.258)		-0.897*** (0.277)	
Interaction: Upstreaming/Segment 4		0.845*** (0.258)	-0.052 (0.281)	
Interaction: Show-more/Segment 4	0.052 (0.281)	0.897*** (0.277)		
Constant	-1.725*** (0.290)	-1.254*** (0.280)	1.361*** (0.290)	-0.020 (0.122)
N	11247	11247	11247	11527
Log Likelihood	-5667.682	-5667.682	-5667.682	-8268.368

	AIC	11469.360	11469.360	11469.360	16584.740
***p < .01; **p < .05; *p < .1					

Source: Consumer survey

Table F.4: Experiment Model Output: Outcome 2 Model

Experiment - Outcome 2 (Logistic)				
	Extended Model - Upstreaming as Treatment Baseline	Extended Model - Default as Treatment Baseline	Extended Model - Show-more as Treatment Baseline	Model - Sociodemographic
Gender: Woman	0.068 (0.066)	0.068 (0.066)	0.068 (0.066)	0.041 (0.058)
Gender: Other	-11.924 (176.352)	-11.924 (176.352)	-11.924 (176.352)	-12.608 (196.345)
Age: 25-39	0.191 (0.117)	0.191 (0.117)	0.191 (0.117)	0.178* (0.106)
Age: 40-54	0.187 (0.119)	0.187 (0.119)	0.187 (0.119)	0.069 (0.107)
Age: 55-64	0.284** (0.123)	0.284** (0.123)	0.284** (0.123)	-0.008 (0.108)
Age: 65+	0.207* (0.122)	0.207* (0.122)	0.207* (0.122)	-0.124 (0.105)
Education: Medium	-0.065 (0.107)	-0.065 (0.107)	-0.065 (0.107)	-0.029 (0.097)
Education: High	-0.159 (0.112)	-0.159 (0.112)	-0.159 (0.112)	-0.092 (0.100)
Income: From time to time	0.012 (0.116)	0.012 (0.116)	0.012 (0.116)	-0.067 (0.104)
Income: Almost never/Never	-0.168 (0.113)	-0.168 (0.113)	-0.168 (0.113)	-0.295*** (0.100)
Country: Czechia	-0.056 (0.176)	-0.056 (0.176)	-0.056 (0.176)	-0.080 (0.157)
Country: Germany	0.188 (0.168)	0.188 (0.168)	0.188 (0.168)	0.048 (0.151)

Country: Denmark	-0.175 (0.199)	-0.175 (0.199)	-0.175 (0.199)	-0.085 (0.157)
Country: Greece	0.065 (0.173)	0.065 (0.173)	0.065 (0.173)	0.058 (0.154)
Country: Spain	0.215 (0.169)	0.215 (0.169)	0.215 (0.169)	0.126 (0.149)
Country: France	0.250 (0.174)	0.250 (0.174)	0.250 (0.174)	0.011 (0.151)
Country: Hungary	0.223 (0.170)	0.223 (0.170)	0.223 (0.170)	0.165 (0.149)
Country: Italy	-0.081 (0.177)	-0.081 (0.177)	-0.081 (0.177)	-0.111 (0.156)
Country: Latvia	-0.159 (0.177)	-0.159 (0.177)	-0.159 (0.177)	-0.178 (0.159)
Country: Netherlands	-0.271 (0.181)	-0.271 (0.181)	-0.271 (0.181)	-0.211 (0.159)
Country: Poland	-0.074 (0.179)	-0.074 (0.179)	-0.074 (0.179)	0.095 (0.152)
Country: Portugal	-0.064 (0.173)	-0.064 (0.173)	-0.064 (0.173)	0.100 (0.150)
Country: Sweden	-0.043 (0.168)	-0.043 (0.168)	-0.043 (0.168)	0.106 (0.151)
Treatment: Default	-1.275*** (0.266)		3.183*** (0.858)	
Treatment: Upstreaming		1.275*** (0.266)	4.458*** (0.843)	
Treatment: Show-More	-4.458*** (0.843)	-3.183*** (0.858)		
Order: Toaster-Fridge	0.258*** (0.084)	0.398*** (0.103)	0.680 (0.458)	

Payment Option Selected in Task 1: Paypal	0.672*** (0.106)	0.672*** (0.106)	0.672*** (0.106)
Payment Option Selected in Task 1: Big Tech wallets	0.696*** (0.143)	0.696*** (0.143)	0.696*** (0.143)
Payment Option Selected in Task 1: Online banking	0.803*** (0.109)	0.803*** (0.109)	0.803*** (0.109)
Payment Option Selected in Task 1: Buy now pay later	0.921*** (0.143)	0.921*** (0.143)	0.921*** (0.143)
Payment Option Selected in Task 1: Other digital wallets	0.926*** (0.229)	0.926*** (0.229)	0.926*** (0.229)
Payment Option Selected in Task 1: Other	1.343*** (0.393)	1.343*** (0.393)	1.343*** (0.393)
Payment Option Selected in Task 2: Paypal	-0.699*** (0.109)	-0.699*** (0.109)	-0.699*** (0.109)
Payment Option Selected in Task 2: Big Tech wallets	-0.460*** (0.133)	-0.460*** (0.133)	-0.460*** (0.133)
Payment Option Selected in Task 2: Online banking	-0.532*** (0.100)	-0.532*** (0.100)	-0.532*** (0.100)
Payment Option Selected in Task 2: Buy now pay later	-0.644*** (0.140)	-0.644*** (0.140)	-0.644*** (0.140)
Payment Option Selected in Task 2: Other digital wallets	-0.914*** (0.220)	-0.914*** (0.220)	-0.914*** (0.220)
Payment Option Selected in Task 2: Other	0.357 (0.303)	0.357 (0.303)	0.357 (0.303)
Financial Literacy Index	-0.406*** (0.109)	-0.406*** (0.109)	-0.406*** (0.109)
Digital Skills Index	0.267* (0.147)	0.267* (0.147)	0.267* (0.147)
Trust in Online Platforms	-0.023 (0.017)	-0.023 (0.017)	-0.023 (0.017)

Trust in Payment Methods	0.011 (0.018)	0.011 (0.018)	0.011 (0.018)
Trust in Consumer Protection	-0.004 (0.013)	-0.004 (0.013)	-0.004 (0.013)
Segment 1: Never-switchers with no capacity	-1.375*** (0.196)	-0.686** (0.267)	0.725 (0.849)
Segment 2: Never-switchers by choice	-0.282* (0.162)	0.004 (0.233)	-2.127 (1.381)
Segment 3: Dual-switchers	-0.031 (0.161)	0.342 (0.230)	-0.719 (0.943)
Segment 4: Multi-switchers	0.075 (0.172)	1.050*** (0.233)	0.611 (0.852)
Preferred device: Smartphone	0.167** (0.074)	0.167** (0.074)	0.167** (0.074)
Preferred device: Tablet	0.073 (0.086)	0.073 (0.086)	0.073 (0.086)
Preferred device: Laptop	-0.012 (0.067)	-0.012 (0.067)	-0.012 (0.067)
Preferred device: Desktop PC	0.091 (0.075)	0.091 (0.075)	0.091 (0.075)
F4: I would feel confident my personal information was secure during the checkout process	-0.044** (0.019)	-0.044** (0.019)	-0.044** (0.019)
F4: I would have concerns about the safety of my financial information	0.002 (0.016)	0.002 (0.016)	0.002 (0.016)
F4: I would have trusted the website would protect my payment details	0.032* (0.019)	0.032* (0.019)	0.032* (0.019)
F4: I would have concerns about potential fraud	0.009 (0.016)	0.009 (0.016)	0.009 (0.016)

Platform feature preferences index	0.025 (0.042)	0.025 (0.042)	0.025 (0.042)
Interaction: Default/Order	0.140 (0.131)		-0.282 (0.469)
Interaction: Upstreaming/Order		-0.140 (0.131)	-0.422 (0.465)
Interaction: Show-more/Order	0.422 (0.465)	0.282 (0.469)	
Interaction: Default/Segment 1	0.689** (0.330)		-1.411 (0.889)
Interaction: Upstreaming/Segment 1		-0.689** (0.330)	-2.101** (0.870)
Interaction: Show-more/Segment 1	2.101** (0.870)	1.411 (0.889)	
Interaction: Default/Segment 2	0.285 (0.283)		2.130 (1.401)
Interaction: Upstreaming/Segment 2		-0.285 (0.283)	1.845 (1.390)
Interaction: Show-more/Segment 2	-1.845 (1.390)	-2.130 (1.401)	
Interaction: Default/Segment 3	0.373 (0.278)		1.061 (0.970)
Interaction: Upstreaming/Segment 3		-0.373 (0.278)	0.688 (0.956)
Interaction: Show-more/Segment 3	-0.688 (0.956)	-1.061 (0.970)	
Interaction: Default/Segment 4	0.975*** (0.283)		0.439 (0.881)
Interaction: Upstreaming/Segment 4		-0.975*** (0.283)	-0.535 (0.867)

Interaction: Show-more/Segment 4	0.535 (0.867)	-0.439 (0.881)		
Constant	-1.222*** (0.333)	-2.498*** (0.369)	-5.681*** (0.881)	-1.782*** (0.179)
N	11247	11247	11247	11527
Log Likelihood	-3616.869	-3616.869	-3616.869	-4568.692
AIC	7367.738	7367.738	7367.738	9185.383
***p < .01; **p < .05; *p < .1				

Source: Consumer survey

**Table F.5: Experiment model output - order effects**

<b>Experiment – Order (Poisson, Generalized Linear Mixed-Effects)</b>		
	<b>Extended Model</b>	<b>Sociodemographic Model</b>
Gender: Woman	0.002 (0.007)	0.006 (0.008)
Gender: Other	-0.031 (0.085)	-0.034 (0.100)
Age: 25-39	0.026** (0.013)	0.029* (0.016)
Age: 40-54	0.003 (0.013)	0.018 (0.016)
Age: 55-64	0.011 (0.013)	0.040** (0.016)
Age: 65+	-0.011 (0.013)	0.021 (0.015)
Education: Medium	-0.016 (0.012)	-0.013 (0.015)
Education: High	-0.022* (0.012)	-0.018 (0.015)
Income: From time to time	0.038*** (0.014)	0.046*** (0.017)
Income: Almost never/Never	0.059*** (0.013)	0.072*** (0.016)
Country: Czechia	0.038** (0.018)	0.010 (0.022)
Country: Germany	0.007 (0.018)	-0.015 (0.022)
Country: Denmark	0.035* (0.021)	-0.011 (0.022)
Country: Greece	0.011 (0.019)	0.010 (0.023)
Country: Spain	-0.028 (0.018)	-0.026 (0.022)
Country: France	-0.007 (0.018)	0.020 (0.022)
Country: Hungary	-0.034* (0.019)	-0.044** (0.022)
Country: Italy	0.005 (0.018)	0.007 (0.022)
Country: Latvia	-0.022 (0.019)	-0.022 (0.023)
Country: Netherlands	0.014 (0.019)	0.003 (0.022)

Country: Poland	-0.005 (0.020)	-0.026 (0.022)
Country: Portugal	-0.0004 (0.019)	-0.002 (0.022)
Country: Sweden	-0.013 (0.019)	-0.035 (0.022)
Treatment: Upstreaming	-0.067* (0.040)	
Treatment: Default	-0.089** (0.038)	
Treatment: Show-More	-0.456*** (0.044)	
Product: Toaster	0.023** (0.009)	
Payment Option Selected in Task 1: Paypal	-0.035*** (0.010)	
Payment Option Selected in Task 1: Big Tech wallets	-0.032** (0.016)	
Payment Option Selected in Task 1: Online banking	-0.005 (0.011)	
Payment Option Selected in Task 1: Buy now pay later	0.002 (0.016)	
Payment Option Selected in Task 1: Other digital wallets	-0.070*** (0.025)	
Payment Option Selected in Task 1: Other	0.042 (0.053)	
Payment Option Selected in Task 2: Paypal	0.017 (0.011)	
Payment Option Selected in Task 2: Big Tech wallets	-0.063*** (0.015)	
Payment Option Selected in Task 2: Online banking	-0.035*** (0.010)	
Payment Option Selected in Task 2: Buy now pay later	-0.043*** (0.015)	
Payment Option Selected in Task 2: Other digital wallets	-0.042* (0.023)	
Payment Option Selected in Task 2: Other	-0.112** (0.045)	
Financial Literacy Index	0.018 (0.013)	
Digital Skills Index	0.041*** (0.016)	
Trust in Online Platforms	0.005** (0.002)	
Trust in Payment Methods	0.001 (0.002)	

Trust in Consumer Protection	-0.005*** (0.001)
Segment 1: Never-switchers with no capacity	0.032 (0.021)
Segment 2: Never-switchers by choice	0.015 (0.020)
Segment 3: Dual-switchers	0.017 (0.020)
Segment 4: Multi-switchers	-0.003 (0.021)
Preferred device: Smartphone	0.008 (0.008)
Preferred device: Tablet	0.015 (0.009)
Preferred device: Laptop	0.007 (0.007)
Preferred device: Desktop PC	0.008 (0.008)
F4: I would feel confident my personal information was secure during the checkout process	0.006*** (0.002)
F4: I would have concerns about the safety of my financial information	-0.001 (0.002)
F4: I would have trusted the website would protect my payment details	-0.002 (0.002)
F4: I would have concerns about potential fraud	0.001 (0.002)
Platform Feature Preferences Index	-0.009** (0.005)
Interaction: Upstreaming/Toaster	-0.018 (0.020)
Interaction: Default/Toaster	-0.044** (0.019)
Interaction: Show-more/Toaster	-0.015 (0.021)
Interaction: Upstreaming/Segment 1	0.039 (0.045)
Interaction: Default/Segment 1	0.116*** (0.043)
Interaction: Show-more/Segment 1	0.421*** (0.047)
Interaction: Upstreaming/Segment 2	0.037 (0.043)
Interaction: Default/Segment 2	0.041 (0.041)
Interaction: Show-more/Segment 2	0.043 (0.046)

Interaction: Upstreaming/Segment 3	0.084* (0.043)	
Interaction: Default/Segment 3	0.021 (0.041)	
Interaction: Show-more/Segment 3	-0.055 (0.047)	
Interaction: Upstreaming/Segment 4	0.098** (0.046)	
Interaction: Default/Segment 4	0.041 (0.044)	
Interaction: Show-more/Segment 4	-0.083* (0.050)	
Constant	1.410*** (0.037)	1.312*** (0.027)
N	21326	21367
Log Likelihood	-47316.610	-47889.400
AIC	94779.210	95828.800
BIC		96028.040
*** p < .01; ** p < .05; * p < .1		

Source: Consumer survey

## G. Annex G

Annex G includes the structure of the questionnaires and the characteristics of respondents of the stakeholder consultation we carried out for the analysis of chapter 3 and 4.

### G.1 The structure of the questionnaire

The aim of the consultation was to enhance market understanding by gathering detailed information on market dynamics, entry barriers, competitive landscape, and relationships among stakeholders.

The structure of each questionnaire is described below.

#### G.1.1 The questionnaire for online merchants

The questionnaire included the following sections:

- a *Business structure* section, aimed at collecting background information on the respondent's online business, as the sector of economic activity and its size;
- an *Offer of payment options* section which investigated which payment methods merchants accept on their proprietary platforms (distinguishing between websites and apps), the main drivers behind this choice and the existence of display practices;
- an *Offer of payment options on marketplaces* section, also as drivers behind merchants' payment solution choices and the competitive strength of various payment methods;
- a *Customer preferences* section aimed to identify trends in payment method usage by consumers, and whether there are some relevant patterns in usage concerning mobile v. desktop devices and apps v. browsers;
- a *Contractual relationships for the provision of payment services* section which collected detailed information on the costs and nature of contractual relationships between merchants and payment service providers with each of their main contractual counterparts. Questions explored the fee structures, any volume-based discounts or other benefits, exclusivity and other restrictive clauses. These information helped the Project Team to better understand the bargaining power dynamics between merchants and PSPs;
- a *Views on Big Techs* section aimed to gauge merchants' perceptions of Big Tech companies' role in the payment services market. Questions probed into merchants' experiences with Big Tech payment solutions, their views on the competitive strength and bargaining power of these companies, and how the entry of Big Techs into payments has impacted their businesses.

The questionnaire for merchants is attached to the present document (separate Annex H).

#### G.1.2 The questionnaire for card schemes

The questionnaire was structured as follows:

- the *Offer overview* section collected data on the scale and geographical scope of respondents; for domestic card scheme, this section had also questions aimed at exploring the main barriers to expansion, including their views on co-badging. This information helped us to understand the scale and scope of ICS operations and the factors influencing their market presence.

- the *Competitive Landscape* section aimed at identifying the respondents' perceptions on the competitiveness of the card schemes sector. Notably, it sought to understand whether ICS regard as competitors also domestic schemes and perceive payment applications relying on alternative payment services (such as A2A payment applications) as competitive threat;
- the *Relationships with Other Industry Stakeholders* section examined the existence and functioning of agreements between card schemes and providers of digital wallets (including the Big Techs'), with the objective to grasp the motivations, benefits, and risks associated with these agreements for ICS;
- the *Monetization* module collected information on factors affecting fees, pricing models, including the payment environment (i.e. browser or app) where the payment occurs.

The questionnaire for card schemes is attached to the present document (separate Annex I).

### **G.1.3 The questionnaire for providers of payment applications**

The questionnaire included the following sections:

- the questionnaire began with an *Offer Overview* section, which allowed to obtain a detailed overview of respondents' offering, including the category of payment application they offer, the payment services on which these rely, what payment cycles are possible through their applications, and their geographical coverage. This section also included a screening question aimed at identifying the Big Techs, based on which services generate the bulk of the respondents' revenues (payment-related related services or other digital and IT services). Based on responses to this question, the following questions were differentiated between Big Techs and their competitors;
- the *Barriers to Entry and Expansion* section investigated the nature of the main obstacles that market players face to enter and expand, which may differ based on the category of respondents; this section also aimed at understanding the specific hurdles national or local providers encounter when attempting to scale their operations internationally. Respondents were asked to detail barriers they encounter with the possibility to use free texts: while this added on the complexity of this section of the questionnaire and on the analysis of results, similar requests for specification have proven very useful to make the results of the questionnaire informative;
- the *Competitive landscape* section aimed at obtaining insights on the competitive constraints that market players exert on one another, which provided useful complementary evidence for the purpose of identifying the boundaries within which we will perform our competition analysis
- the *Relationships with Other Industry Stakeholders* section investigated the nature and conditions of the relationships with industry players active at other stages of the online payments value chain (banks, card schemes, PSPs), notably for digital wallets, since they served the purpose of providing inputs for the assessment of their partnerships with ICS;
- the *Conditions Agreed with Merchants* section examined the contractual conditions and fees agreed upon with merchants, and the factors that influence them;
- the *Integration of digital wallet with other IT and digital services* section included questions that were meant to be addressed to Big Techs only, aimed at gathering information on how Big Techs may have leveraged their position in other IT

markets to boost their payment wallet. Big Techs were also asked about whether they combine payment-related data with other user data.

The questionnaire for providers of payment applications is attached to the present document (separate Annex J).

#### G.1.4 Characteristics of questionnaires respondents

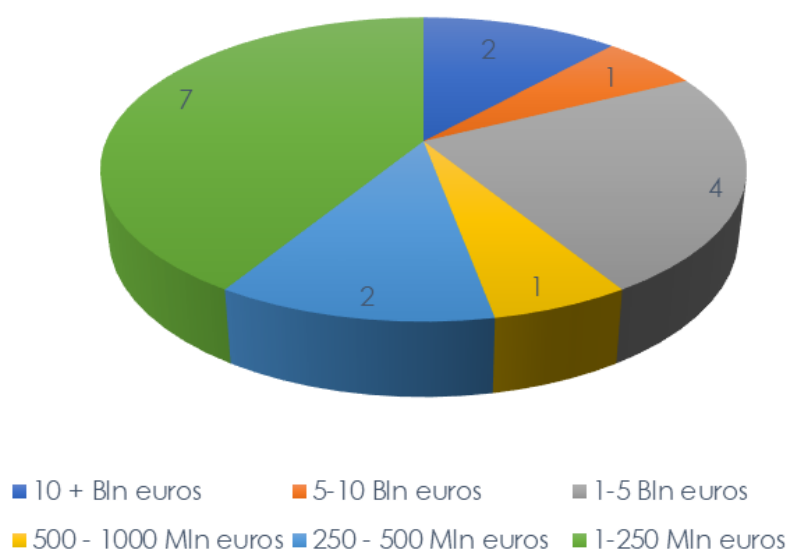
Responses from 35 companies belonging to various target groups were collected. Since initially it was possible to provide answers anonymously, a total of 12 responses were provided in this manner. Specifically, 7 in response to the merchant questionnaire, 1 to that of the card schemes, and 4 to that of the providers of payment applications were given anonymously. This section lists the respondents and provides a short description of the main characteristics of the respondents within each category.

#### G.1.5 Online merchants

A total of 17 responses were collected from online merchants registered in EEA countries, and one response was provided by a merchant registered in Switzerland.<sup>431</sup>

Respondents include merchants of various size, as approximated by their reported turnover generated by online sales: Figure G.1 presents the distribution of respondents based on ranges of turnover from online sales in 2023.<sup>432</sup>

**Figure G.1: Respondents' distribution by range of turnover**



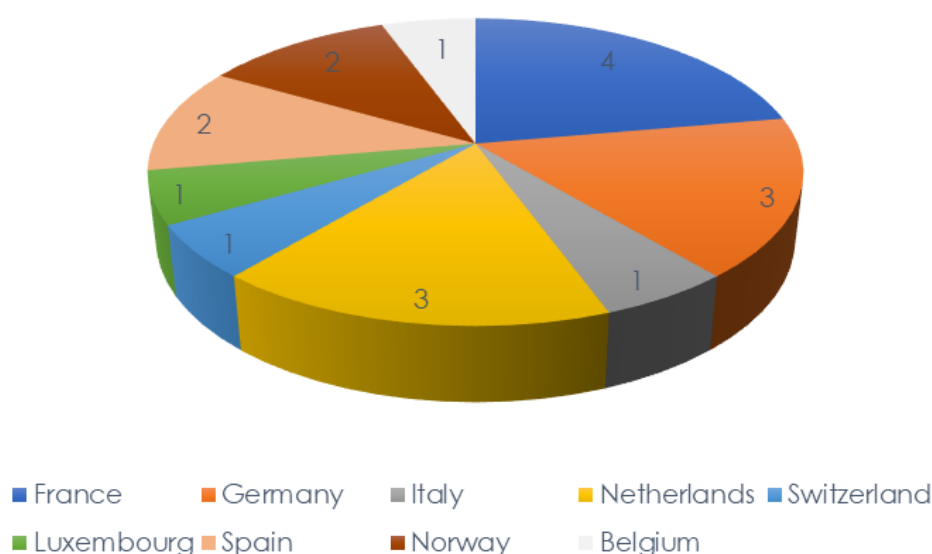
Source: Stakeholder consultation

<sup>431</sup> We received one additional response by one Chilean company, which however was excluded from the analyses and from the descriptive statistics provided in this section since it was considered to be out of the scope of the study.

<sup>432</sup> One respondent did not reply to this question.

As shown in Figure G.2, respondents are registered in 9 different European countries (Switzerland included). France, Germany, and the Netherlands are the most represented countries, each having at least three respondents based in the country. It is important to consider that the merchant questionnaire asked companies to indicate only their country of registration. However, some of these online merchants operate in multiple European countries. A merchant specified that its responses consider many European countries<sup>433</sup>, including 11 of the 14 selected countries. Three respondents are also active in all the selected countries, while one operates in nine of them. Finally, a respondent is expected to be operational in Germany, Denmark, Spain, France, Italy, and Sweden.

**Figure G.2: Respondents' distribution across countries of registration**

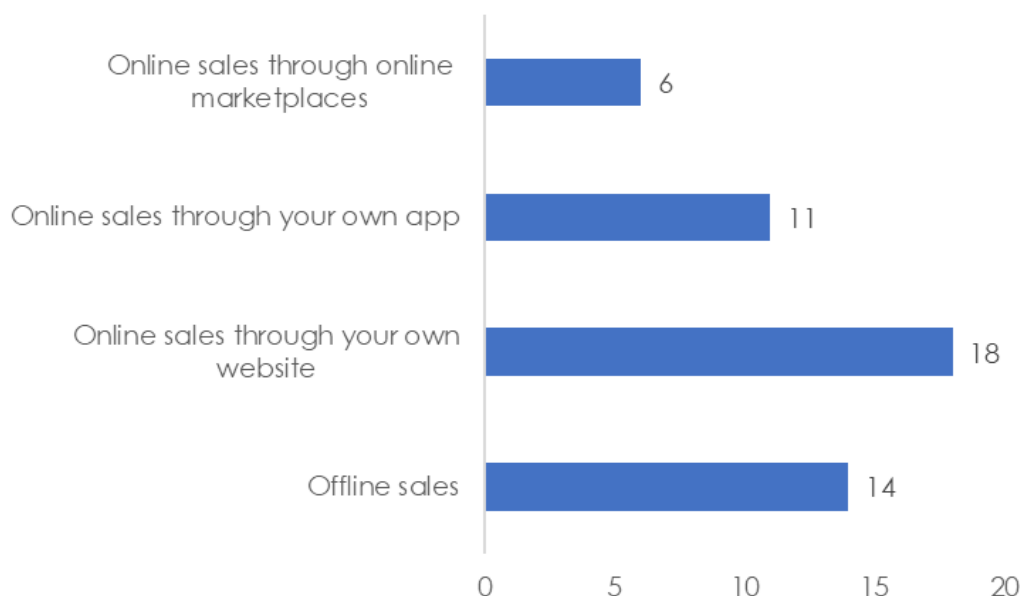


Source: Stakeholder consultation

Finally, our respondents' resort to a variety of sales channels, including their own platforms (both websites and apps), third-party platforms (marketplaces) and physical stores (offline sales). Figure G.3 presents the distribution of respondents based on their sales channels: all online retailers have their own website; 11 of them also have an app; 6 of them also rely on third-party marketplaces for their offline sales; 14 of them also sell through offline channels.

<sup>433</sup> They explicit referred to Austria, Belgium, Denmark, Croatia, Finland, France, Germany, Hungary, Ireland, Italy, the Netherlands, Poland, Portugal, Slovenia, Slovakia, Spain, and Sweden.

**Figure G.3: Respondents' distribution by channel of sales**



Source: Stakeholder consultation

### G.1.6 Card schemes

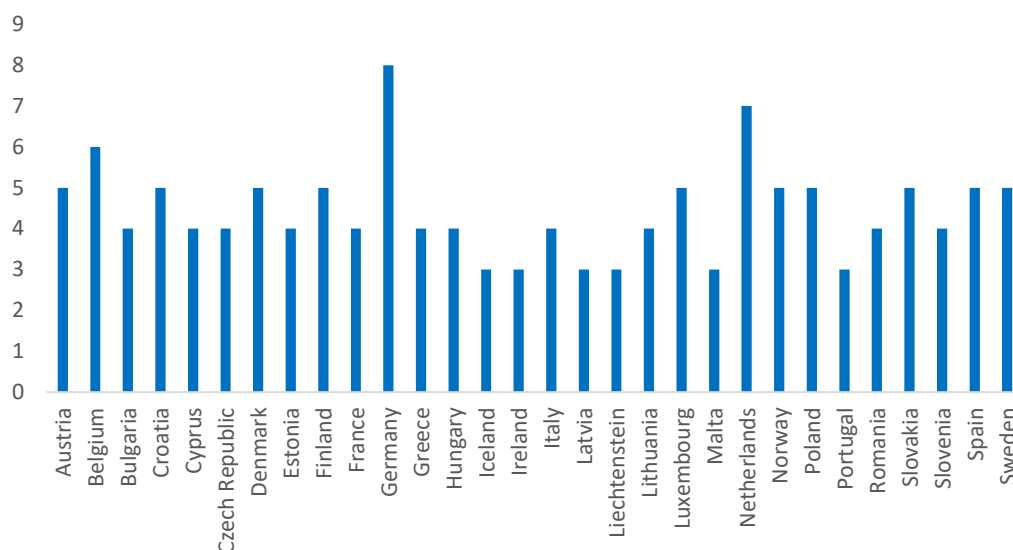
A total of 4 card schemes contributed to our consultation. Respondents include two domestic schemes, one ICS and one anonymous respondent. Another ICS did not reply to the questionnaire but submitted a written contribution covering topics they consider relevant for a competitive assessment of the online payment market. One respondent replied to the questionnaire only partially and, additionally, provided written contributions. One additional reply by an anonymous respondent reveals that it is likely an issuing bank, hence out of the target of the questionnaire. However, its response has been considered in our assessment where relevant.

### G.1.7 Providers of payment applications

A total of 13 responses were collected from providers of payment applications.

Respondents include both global players and players with a more regional presence in the EEA, including domestic ones. They were asked to indicate all the EEA countries where they are active in online payments market: Figure G.4 shows the distribution of respondents across EEA countries, based on the replies to this question.<sup>434</sup>

<sup>434</sup> For this graphical analysis, the 3 providers who defined themselves as global players are assumed to be available in all EEA countries.

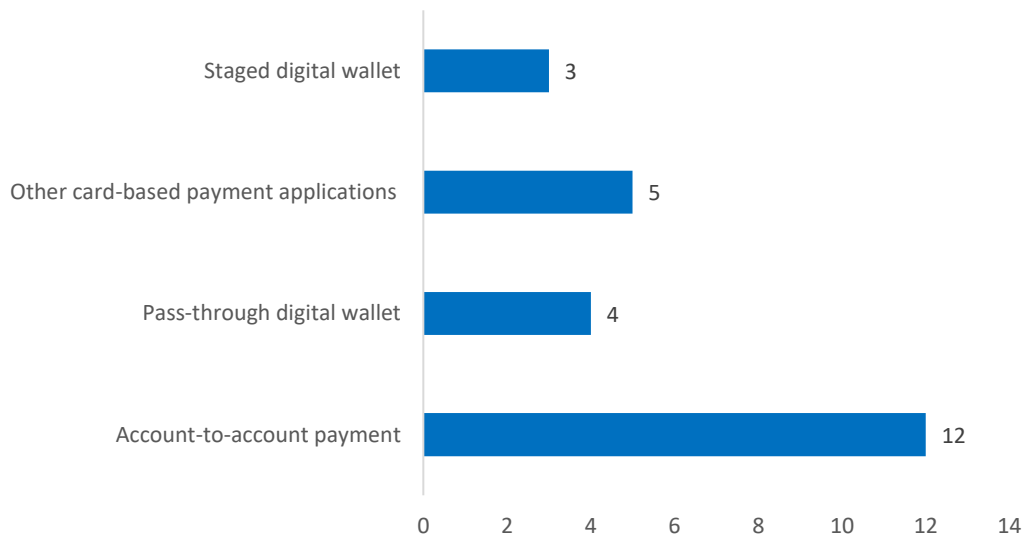
**Figure G.4: Distribution of respondents across EEA countries**

Source: Stakeholder consultation

As explained in section G.1 above, respondents were asked to report some characteristics of the payment applications they offer, including the type of payment applications and the payment services on which their application relies. Their replies to these questions are presented in Figure G.5 and Figure G.6 below.

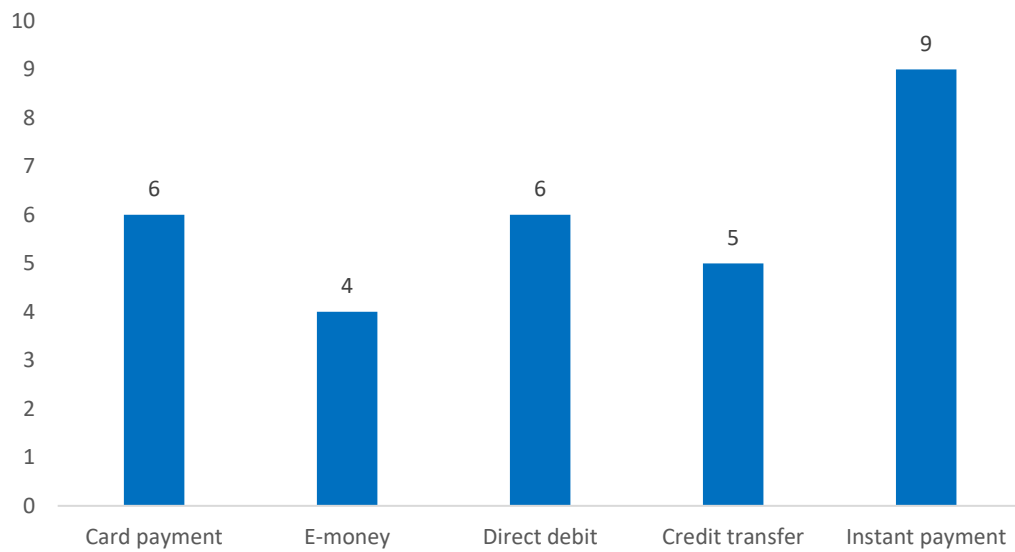
- as shown in Figure G.5 most of our respondents (12 out of 13) provide or support account-to-account payment (A2A) applications in the EEA; 8 provide digital wallets (3 offer a staged wallet, while 5 offer a pass-through wallet); finally, 5 reported they offer or support card-based payment applications other than wallets. Some of our respondents reported that their applications belong to more than one category: for example, one provider described its payment application as both a staged digital wallet, an A2A payment solution and a card-based payment application different from wallet while two operators reported to support both a pass-through digital wallet and an account to account payment solution;
- as shown in Figure G.6, 9 respondents reported that their applications rely on instant payments; 6 respondents offer the possibility to make payments via card or direct debit through their payment applications; 5 respondents indicated their payment applications supports credit transfers; and 4 respondents offer applications that rely on e-money. Also answering these questions seven providers reported their applications allow the use of multiple payment services.

**Figure G.5: Categories of payment applications provided or supported by respondents**



*Source: Stakeholder consultation*

**Figure G.6: Payment services that can be used by respondents payment application in 2023**



*Source: Stakeholder consultation*

## **H. Annex H**

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## K. Annex K

Annex K includes the additional analysis of the share of value of e-commerce transactions of selected providers in the segment of digital wallets including additional local payment methods, as described in chapter 3.

**Table K.1: Share of value of e-commerce transaction of selected providers in the segment of digital wallets**

		AT	CZ	DK	FR	DE	EL	HU	IT	LV	NL	PL	PT	ES	SE
Pass-through digital wallet	ApplePay	7.10%	32.52%	24.91%	12.66%	14.02%	18.34%	27.32%	11.71%	31.70%	24.17%	9.20%	3.74%	8.58%	22.31%
	GooglePay	1.31%	31.61%	7.94%	7.81%	4.54%	27.55%	32.63%	6.06%	28.29%	10.86%	4.21%	7.37%	7.52%	12.78%
	MasterPass	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	SamsungPay	-	-	-	1.48%	-	-	-	-	-	-	-	-	6.62%	9.01%
	FacebookPay	-	-	-	-	-	-	-	-	-	9.69%	-	-	-	-
	MobilePay	-	-	51.78%	-	-	-	-	-	-	-	-	-	-	-
	VisaCheckout	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	CaixaWallet	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Giropay	-	-	-	-	4.12%	-	-	-	-	-	-	-	-	-
	e-Postepay	-	-	-	-	-	-	-	24.38%	-	-	-	-	-	-
	Paysera	-	-	-	-	-	-	-	-	7.65%	-	-	-	-	-
	BBVAWallet	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ClicktoPay	0.74%	2.25%	-	0.66%	-	-	2.83%	-	-	2.88%	0.32%	-	0.48%	1.83%
Local payment method*	Blik	-	-	-	-	-	-	-	-	-	-	78.46%	-	-	-
	MB WAY	-	-	-	-	-	-	-	-	-	-	-	54.29%	-	-
	Swish	-	-	-	-	-	-	-	-	-	-	-	-	-	37.27%
Staged digital wallet	PayPal	84.04%	33.62%	15.37%	55.08%	76.29%	54.11%	37.23%	49.05%	32.37%	37.06%	7.80%	34.60%	63.24%	16.72%
	AmazonPay	6.81%	-	-	22.31%	1.03%	-	-	8.80%	-	15.34%	-	-	13.55%	0.09%
Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Note: "-" indicates that the service has been discontinued or was not launched.

\* These local payment methods do not fall into the category of digital wallet (but into PIS) according to our taxonomy.

Source: Based on Capgemini data



<https://europa.eu/!Tc4f4Y>

