

MEMORANDUM

From	E.CA Economics
To	EDEKA ZENTRALE AG & Co. KG
Subject	EU study “The impact of modern retail on choice and innovation in the EU food sector”
Date	25 January 2015

1 Introduction

The European Commission (EC) has recently published the study on “The economic impact of modern retail on choice and innovation in the EU food sector”, 5th December 2014 (EU study). The EU study comprises data from multiple sources concerning various member states (MS) and time periods, at the national and at the local level. It relies on descriptive and econometric analyses. The EU study addresses important questions on whether and how developments in the retail sector may have affected choice and innovation in the EU food sector.

EDEKA has asked us

- to summarise our understanding of the EU study’s approach and its main findings as the latter concern (i) the national procurement level and (ii) the local retail level;
- to assess the representativeness of the EU study, in particular with regard to MS not covered in the econometric estimation, and more specifically with regard to Germany;
- to briefly discuss the main findings in light of important policy questions in the context of alleged bargaining power of retailers due to concentration at the retail level and private label penetration.

Our assessment is contained in the sections to follow. The final section summarises our main conclusions. Our assessment is based on our best understanding of the EU study’s findings as presented therein.

2 Approach and main findings

The EU study aims at identifying important drivers of choice and innovation in the EU food sector. Next to descriptive statistics, the EU study employs an econometric model in order to estimate the impact of various drivers on choice and innovation. Below we summarise our understanding of the methodology as well as the results of the econometric analysis.

a) Approach

In estimating the relationships, due to practical considerations (such as data availability, comparability of data across different sources, etc.), the econometric analysis does not cover all MS but focuses on five MS (Italy, Spain, France, Portugal and Poland) for a long data set (2004H1 - 2012H2), and seven other MS (additionally Belgium and Hungary) for a shorter data set (2008H1 - 2012H2).

As for choice the econometric study considers measures of product variety, product size variety, product supplier variety and product price variety both at the national (procurement) level and the local retail level (i.e. shops contained in the sample).

As for innovation the econometric study considers the measures Opus innovation, new products, new packaging, new formulations and new range extension, again both at the national level and the local level.

The EU study thus employs a multi-dimensional approach of choice and innovation which appears useful in order to allow for possibly varying impacts on different types of choice and innovation. Moreover, the distinction between national (procurement) markets and local retail markets is useful, as they differ from an antitrust and policy perspective. Hence, again the EU study allows for possibly varying effects and conclusions depending on the markets.

The potential drivers of choice and innovation include:

- Modern retail concentration - at the procurement (national level) and at the local level
- Supplier concentration - at the procurement level
- Imbalances between modern retailers and suppliers - at the procurement level
- Private label share - at the procurement and the local level
- Product category turnover - at the procurement level
- New shop openings at local area
- Shop type and shop floor space
- General economic drivers: (i) unemployment, (ii) retailer business expectation, (iii) population and (iv) population density.

The EU study comprises data on a cross section of stores belonging to the population of modern food retail and on the characteristics of the catchment areas in which they are

located. The data is collected not once but at multiple points in time. The procedure of repeatedly observing the same cross section of stores over time results in a data structure known as a **panel dataset**.

Panel data allow tracking variation in outcomes both over time and in the cross section. In this study, panel data track both how the dependent variables (such as different measures of choice and innovation, e.g. product variety) as well as explanatory variables (e.g. measures of retailer concentration or private label penetration) vary over time in a catchment area and how these variables vary across different catchment areas at a given point in time. On the one hand, product variety and retailer concentration may vary *across catchment areas at a given point* in time because the number of stores, their absolute and relative size, and their ownership structure may change. On the other hand, product variety and concentration in a *given catchment area may vary over time* because new stores may enter a catchment area, existing stores may leave a catchment area, and the ownership structure of stores may change. Other relevant variables can also exhibit variation in levels over time, over catchment areas or over both dimensions.

Panel data is useful if the dependent variable (i.e. choice or innovation) depends on explanatory variables, which are not observable but correlated with the observed explanatory variables. For example, providing a bigger portfolio of products to the consumers can be more costly (e.g. because it requires more procurement effort) and this cost might not be observable by the researcher. However, if such omitted variables are constant over time, panel data estimators allow consistently estimating the effect of the observed explanatory variables. Different econometric models and estimators exploit the two dimensions of variation in different ways. Each of these econometric models and estimators has advantages and disadvantages.¹

The EU study relies on estimation results of two classes of models - fixed effects models and random effects models. Generally, the difference between the two types of models is that in the **random effects model**, the store-specific effect is a random variable that is assumed to be uncorrelated with all the explanatory variables while in the **fixed effects model**, the store-specific effect is a random variable that is allowed to be correlated with the explanatory variables. Thus, the random effects model is based on a more restrictive set of assumptions.

More specifically, because fixed effects model allow for correlation between the store specific fixed effects and other explanatory variables (while random effect model does not), the fixed effect model could be considered more general. If random effects model is estimated while its underlying assumption that unobserved fixed effects are uncorrelated with explanatory variables is not satisfied, the statistical inferences from the random coefficient model are going to be misleading (i.e. the estimated coefficients are biased in this case).²

For example, suppose that the observed level of innovation (e.g. the number of newly introduced EAN codes) depends on the shop format strategy. Suppose further that the shop format strategy is (at least) partly unobservable by the researcher.³ In such instances, if private label penetration is related to shop format decisions (a plausible presumption), the

¹ See e.g. Jeffrey M. Wooldridge “Introductory Econometrics: A Modern Approach”, 4th edition, page 493.

² See e.g. Jeffrey M. Wooldridge “Introductory Econometrics: A Modern Approach”, 4th edition, page 505. William H. Greene, “Econometric Analysis”, 5th edition, page 294.

³ The EU study does control for shop format strategies by grouping shops into three categories: hypermarket, supermarket and discounter. However, there is no clear cut definition for these categories; the boundaries are multidimensional and can be blurred. Finally, controlling for three distinct categories ignores more gradual shop format variations within the categories.

random effects model may wrongly conclude that higher private label penetration (as opposed to certain unobserved shop format strategies) will cause a decline in innovation.⁴ If (unobserved) shop format decisions across catchment areas were constant over time, the fixed effect model could be used instead to obtain consistent estimates.

However, fixed effects models have limitations too.⁵ In particular, estimating fixed effects models requires variation of the key (observed) explanatory variable over time. This is because the fixed effects estimator uses a data transformation (time demeaning or differencing) which removes all constant unobserved effects prior to estimation. However, the same transformation also removes any explanatory variables that are constant over time. If this is the case, the fixed effects model cannot be used to estimate the effect of the time-invariant explanatory variable on the variable of interest (i.e. choice or innovation). The EU study is likely to involve some variables with little variation over time, whilst the same variables will likely vary substantially across catchment areas (e.g. store ownership/format/size, etc.). We note that this may restrict the applicability of fixed effects models in the study.

It is common practice to apply both random effects and fixed effects models and to test for statistically significant differences in the coefficients on the time-varying explanatory variables using the Hausman test. The idea behind that approach is that the random effects estimates are used unless the test rejects the hypothesis that the unobserved fixed effect is uncorrelated with each explanatory variable. In the latter case the results of the random coefficient model are biased and results of the fixed effects model are used. The study proceeds in this way. In practice, however, the Hausman test is constructed in such a way that this procedure prefers the random effects model only if the estimates of the random effect model and the fixed effects model are sufficiently close to each other (so it does not matter much the results of which model are used). Otherwise (i.e. when the Hausman test rejects the hypothesis that the fixed effects and explanatory variables are not correlated) the results of the two models differ significantly, but in that case only the results of the fixed model are preferred (as the estimates of the random effects model are presumably biased).⁶

In light of the above, the econometric literature advises that if both models can be estimated on the same data set the results of the fixed effects model should be generally considered more reliable than results of the random coefficient model for policy analysis using aggregated data.⁷ However, for the study in question, some explanatory variables are unlikely to vary sufficiently over time, for the fixed effects model to find statistically significant effects. Therefore, results of the random effects model might be the only hints towards such effects. Unfortunately, the study is not always transparent what effects and conclusions are derived based on which type of model.

In summary, the econometric specifications differ in terms of (i) the long vs. the short time period, (ii) the random vs. the fixed effects estimation and (iii) retailer concentration and private label penetration is measured at the procurement (national) level or the local retail shop level.

⁴ We shall get back to this while discussing policy conclusions below.

⁵ See e.g. Jeffrey M. Wooldridge “Introductory Econometrics: A Modern Approach”, 4th edition, page 493.

⁶ There is another possibility for the Hausman test to fail to reject the random coefficient model. It happens when the sampling variation of the fixed effects model estimates is so large that one cannot infer that the differences between the models are statistically significant (even though they can be substantial).

⁷ See e.g. Jeffrey M. Wooldridge “Introductory Econometrics: A Modern Approach”, 4th edition, page 493.

b) Summary of main findings

Below we summarise our understanding of the main findings concerning the impact of retailer concentration, the imbalance of retailer to supplier concentration and private label shares - that is those variables that may raise competitive concerns, and may trigger legislative interventions in the food chain and especially at the retail level. As concerns and interventions may relate to both procurement markets and retail markets independently, we distinguish findings concerning (i) the procurement (national) level and (ii) the retail (local) level, respectively. We then move on to briefly address other control variables in order to gain a better understanding of the overall plausibility and reliability of the EU study.

(i) Procurement (national) level:

- **Retail concentration and choice - no evidence:** Relying on few observations, the EU study found *no evidence* that retail concentration at the procurement level affected choice.
- **Retail concentration and innovation - no or slightly positive impact:** The EU study does not draw strong conclusions concerning the impact of retail concentration on innovation (relying on few observations). If anything, however, the data suggested a *positive* impact of retail concentration on three out of five measures of innovation, one being negative and one being undetermined.
- **Imbalance between retailer and supplier concentration:** The results resemble, by and large, the results of the individual measures of retailer and supplier concentration. In particular, the study does not find clear evidence concerning choice, whilst it finds statistically and economically positive effects on innovation as a result of relatively higher retailer concentration - here, the results become more pronounced than for retailer concentration alone because supplier concentration alone tends to decrease innovation.
- **Private label and choice - no or slightly positive impact:** The EU study found some evidence for *positive* (albeit small) effects of private label penetration on choice (based on both the log linear and the extended quadratic specification).
- **Private label and innovation - no evidence:** The EU study found *no evidence* for private label penetration to affect innovation in a statistically and economically significant way (based on both the log linear and the extended quadratic specification).

(ii) Retail (local) level:

- **Retail concentration and choice - no evidence:** The EU study concluded that there was no evidence that retail concentration at the local level affected choice.
- **Retail concentration and innovation - negative impact for a single out of four measures:** The EU study found for *none but one* measure of innovation (i.e. new packaging) a statistically and economically significant *negative* effect on innovation.
- **Private label and choice - no economically significant impact:** Based on the same specification as for other drivers (log linear), the EU study mainly found statistically significant, but economically insignificant positive effects. Based on the modified non-

linear (quadratic) specification, the EU study found statistically significant, but economically insignificant negative impacts of private label penetration.

- **Private label and innovation - no or negative impact depending on the specification:** Based on the same specification as for other drivers (log linear), the study found no statistically and economically significant effects. Based on the modified non-linear (quadratic) specification, the study found statistically and partly economically significant negative effects on innovation.

Against this described background above it appears that some of the most interesting variables from a policy perspective have little or inconclusive impact on choice and innovation. However, as we point out in Section 4 below, economic theory would indeed not necessarily suggest clear-cut hypotheses and effects of variables such as retailer concentration, imbalance of retailer and supplier concentration and private label shares. Hence, the lack of clear-cut findings may well and correctly reflect economic reality. This notion is supported by the fact that the EU study does indeed seem to find more robust and stronger results with regard to other drivers - indeed those which may often motivate stronger *ex-ante* presumptions, albeit (sometimes) less relevant from a policy perspective:

- **Supplier concentration has a negative impact on most measures of innovation:** Higher supplier concentration may reflect lower competition among suppliers. Therefore, higher supplier concentration may result in less choice and innovation. However, higher profit margins (in particular relating to incremental profits due to choice or innovation) may also enable and incentivise choice and innovation. There are hence no clear predictions from a theoretical point of view. The study finds no empirical evidence concerning the impact on choice, whilst it finds evidence suggesting a negative impact on innovation.
- **Product category turnover has the expected impact on (some measures of) choice and innovation:** The larger the turnover, the larger the sales base across which investments in sales and innovation could be spread. Equally, a larger sales base may allow for more entry and hence more competition, hence more choice and innovation.
- **New shop openings at the local level have the expected impact on (some measures of) choice and innovation:** As competition increases locally, it appears that choice and innovation may increase.
- **GDP per capita and retailer business expectation have expected impacts on choice and innovation, respectively:** Better business prospects relate to higher expected profits. It is plausible that higher expected profits also result in higher incremental profits due to investments in choice and innovation. In addition, investments may be viewed less risky (in terms of potential defaults) in light of better prospects.
- **Shop type and floor space have expected impacts on choice and innovation:** As one would have expected, discounter feature significantly less choice and innovation than supermarkets which in turn feature less choice and innovation than hypermarkets. Similarly larger outlets allow for more choice and innovation.

Hence, even though some policy related variables (such as buyer concentration and private label shares) do not appear to have a strong impact on either procurement or local markets, other variables have statistically and economically significant and expected impacts. We have

therefore no reason to believe that there are issues concerning the defined measures of choice and innovation, their underlying data or the econometric approach in general.

3 Representativeness

In statistical practice, cost and time considerations typically are prohibitively high to allow analysis of entire populations of interest. Instead, the inferences are based on the analyses of “representative” subsets of the population called “samples”. Because some population members are excluded from the sample, this raises the question to what extent the results of the analysis can be generalised to the whole population. In the present case the question is whether the EU study can be extended to countries that have not been included in the analysed sample, e.g. to Germany. **The answer to that question is positive, if the sample is representative of the population.**

The representativeness of the sample can be ensured through random sampling. In the EU study the subset of the member states used for the analysis was not chosen randomly. Yet, it was chosen (or considered) to be **representative**, for it covered a broad variety of situations. In particular the EU study discusses:

- (i) population size,
- (ii) type of living zone and standard of living,
- (iii) retail concentration at the national level,
- (iv) supplier concentration at the national level, and
- (v) private label share at the national level.

a) General observations

The above appear to be relevant sample characteristics (as relevant determinants of choice and innovation). They may not necessarily cover all relevant characteristics though. Indeed, these characteristics do not cover all relevant explanatory variables such as product category turnover, new shop openings, and unemployment. We can therefore not assess, whether the sample could be considered representative with regard to all relevant characteristics.

With regard to the above characteristics the sample seems to cover a broad variety of situations - i.e. there is a lot of variation in the levels of these characteristics. This hints at featuring variation in other relevant characteristic, too. We also note that the selected sample of consumer shopping areas used for the econometric analysis closely resembles the situation across EU 27 in terms of population size, real GDP per capita and type of living zones (urban vs rural), as is documented in detail in Section 4.4 of the EU study. Against this background there are no indications suggesting severe limitations in representativeness.

Further, given the number of different characteristics considered, distributions in the sample and population are unlikely to be equal. For example, the EU study finds that hypermarkets are overrepresented in the sample compared to the population as a whole (p. 186). Such

deviations are not necessarily problematic. As long as (i) there is enough variation in the sample for the given characteristic (i.e. there is a large number of stores of different formats included in the analysis), which (ii) is controlled for (i.e. that the store type is an explanatory variable included in the specification of the model) and that (iii) is uncorrelated with other factors influencing the dependent variable but unobservable to the econometrician (e.g. consumer preferences or behavioural pattern, legal environment, etc.), the regression estimation procedure will produce consistent results. It seems that the study satisfies at least the first two conditions, whilst the third one is commonly difficult to assess. Hence, also in this respect there are no indications suggesting severe limitations in representativeness.

b) Observations concerning Germany

As stated above, the sample seems to cover a large variety of different situations in different EU member states. We understand that the sample distribution of these situations seems to be broadly consistent with the real distribution, or diverging distribution is controlled for by explanatory variables (e.g. shop format). Therefore, in general, the sample appeared representative, at least for broad range of MS. Below, we briefly address whether the sample appears representative for Germany, in particular.

In that regard we consider the model's predictions more reliable and accurate for non-covered member states, the better a non-covered MS's relevant characteristics match the characteristics of the sampled member states (all else equal).

Specifically, if the range of values used for the estimation is fairly uniformly and densely covered by the sample, the predictions for other population members, for which the explanatory variables are within the sample ranges used for estimation (i.e. **interpolation**), it is relatively reliable and accurate. Intuitively, the predictions of the model are in such situation used only to fill in the intermediate holes in the data. However, as values of the explanatory variables range far outside the range covered by the sample used in the estimation, the predictions of the model (i.e. **extrapolation**) become less reliable and may be less accurate. Intuitively, the further away we venture into the unknown, the higher the uncertainty. This general principle that interpolation is more reliable than extrapolation is also reflected in the wording of the results of the EU study. For example, the summary states that "econometric analyses found very little evidence of a relationship between modern retailer concentration (at either local or national level) and the level of choice made available to consumers", whilst it caveats this conclusion stating that "the countries in the sample did not include those with the highest levels of national modern retailer concentration".

For most of the values of explanatory variables considered in the EU study, Germany lies within the range (between the extreme values) of the sampled MS, or is very close to it.⁸ This suggests that the results of the study can be interpolated to hold also for Germany and would not have to be extrapolated to (extreme) values far outside the sample values.

⁸ It is possible that the sample were not representative for certain countries due to multiple characteristics in combination. The available information, however, does not hint towards such a situation as far as Germany is concerned. Germany's private label share is only marginally higher than the sample range; and even though the unemployment rate is lowest in Germany, GDP per capita lies within the sample range.

Table 1: Comparison of ranges of selected characteristics for sample used in the study and for Germany

Characteristic	Max value for sample	Min value for sample	Value for Germany
National retail concentration (HHI)	2020 (Belgium)	1170 (Italy)	1957 (national level)
Local retail concentration (C5)	66% (France)	24% (Italy)	n/a
Private label's share (2012)	32% (Spain)	11% (Poland)	33%
Unemployment rate (Oct 2014)	24.0% (Spain)	5.7% (Czech Republic)	4.9%
Nominal GDP per capita (2013)	44,400 EUR (Denmark)	9,900 EUR (Hungary)	33,300 EUR
Population density (people / km ²)	344 (Belgium)	87 (Spain)	225

Sources: Table 3, Table 21, Table 25, Eurostat

In conclusion, while there are no indications suggesting severe limitations concerning the sample's representativeness in general, there are also no indications suggesting severe limitations concerning Germany in particular. In that respect, the study's main findings appear as relevant for Germany as they appear to be for the sampled MS.

4 Discussion and policy implications

Section 2 summarised the main findings of the EU study. We understand that the EU study considers the main findings to hold for all MS with the possible exception of those MS with a very high level of retail concentration (e.g. Finland, Latvia and Sweden). In particular, the study seems to include no limitations with regard to Germany. Based on a brief review of the study, there appeared no reasons to doubt the above findings and conclusions in a material way.

As mentioned in sections 2 and 3 of the study, the findings concern relevant policy questions in an environment of increasing shares of modern retail as well as increasing shares of top 10 modern retailers. Private labels, too, have developed steadily within the past years.

More specifically, there is an ongoing debate concerning too strong bargaining power of modern retailers vis à vis their suppliers. In that context, for example, the German Federal Cartel Office recently published a food sector inquiry which concluded that a group of four retail chains (i.e. EDEKA, Rewe, Schwarz Gruppe (Lidl) and Aldi) had maintained strong 'buyer power' in Germany.⁹ Buyer power, in turn, was considered a consequence of retail concentration and retailers' private labels. The German study also alluded to potential

⁹ See Bundeskartellamt, Sektoruntersuchung Lebensmitteleinzelhandel, September 2014.

negative effects of buyer power on the German food sector, although the study did not contain any own empirical investigation of the latter.¹⁰

Although the EU study does not offer any policy conclusions, its findings do shed important light on above sketched discussion of buyer power - in general and for Germany, in particular. We discuss important policy implications below:

- **a) Theory of harm due to buyer power rests on potentially negative effects on choice and innovation:**

The immediate effect of larger buyer power is better procurement conditions, in particular in terms of lower wholesale prices. Under fairly general conditions lower wholesale prices will - at least partly - be passed on to consumers. Thus, larger buyer power tends to decrease prices for consumers. This principle is widely accepted and, accordingly, acknowledged as a pro-competitive effect of horizontal mergers.¹¹

Therefore, negative effects of buyer power would have to rest on longer-term effects. According to such a theory of harm, if buyer power were to reduce suppliers' margins then suppliers would have lower incentives to invest in varied or new products. In the longer term, therefore, buyer power might hamper choice and innovation to the detriment of consumers.

Indeed, incentives to invest (in choice or innovation) hinge on the financial benefits of such investments. However, it is important to note that investment incentives are driven by the marginal gains of investment relative to the non- (or lower) investment case. For example, a supplier's current margins might be low (supposedly due to buyer power), whilst more product variety and innovate products may substantially increase its margins, as they would give him a lead over other national and private label brands. Hence, suppliers may have high incentives, notwithstanding, or in fact due to, buyer power. What matters is whether buyer power would decrease or increase suppliers' gains from incremental investment in choice or innovation. The EU study provides important insights, as discussed below.

- **b) The EU study suggests that retail concentration at the procurement level has no (negative) impact on choice and innovation:**

This finding suggests at least one out of the following two possibilities:

- **Retail concentration at the procurement level does not increase buyer power:**

In the policy debate, retail concentration, or simply a purchaser's size, is often associated with buyer power. The economic literature, however, does not support such a clear cut presumption. In particular, for a reference case in which costs and revenues increase linearly in the procurement volume, retail concentration (or larger procurement volumes) tend not to affect buyer power (**Nash bargaining solution**). In situations, in which retailer concentration would eliminate a true outside option for a

¹⁰ A comprehensive discussion of the German sector inquiry is contained in the E.CA report "Sektoruntersuchung Lebensmitteleinzelhandel - Anmerkungen aus ökonomischer Sicht", which Edeka forwarded to the German Federal Cartel Office and to the European Commission (on 19 January 2015).

¹¹ European Commission, Merger Guidelines.

supplier (but by no means all concentrations will), it may indeed increase buyer power; whereas in situations, in which retailer concentration combines complementary buyers or procurement volumes, it may just as well decrease buyer power. Obviously, the EU study does not address the question of buyer power directly. But to the extent that one assumed a harmful impact of buyer power on choice and innovation, the EU study would suggest that retail concentration at the procurement level would not increase buyer power in the first place (for it finds no impact on choice and innovation).

□ **Buyer power (in terms of retail concentration) does not hamper choice and innovation:**

As discussed above, if one assumed a harmful impact of buyer power on choice and innovation, the EU study would cast serious doubt on a relation between retail concentration and buyer power. As an alternative explanation, obviously, even if buyer power did exist due to retailer concentration (or larger procurement volumes), the empirical findings would reject the hypothesis that buyer power had a negative impact on choice and innovation. Again, this finding appears highly relevant, because such a negative impact would constitute the main element of a valid theory of harm due to buyer power. As to the weak evidence pointing towards a positive impact of retail concentration on innovation, the study would support the hypothesis that buyer power may keep suppliers on their toes.

In summary the findings of the EU study are consistent with either retail concentration (at the procurement level) not increasing buyer power, or buyer power (due to retail concentration) not hampering choice and innovation, or indeed with both. Regardless of which of the aforementioned possibilities apply: The results reject a presumption of negative effects of buyer concentration (and any related structural indicators for that matter) on choice and innovation at the procurement level.¹² In that respect, the EU study does not support competitive concerns of retail concentration at the procurement level from an empirical perspective. It clarifies that legislative activities may not simply rely on presumed competitive harm due to buyer power. Rather, interventions due to concerns of buyer power would require empirical evidence showing likely anti-competitive effects in the relevant market at question.

● **c) The EU study suggests that the imbalance of retailers and suppliers (at the procurement level) has a positive effect on innovation:**

If retailer concentration increases relative to supplier concentration, this has a positive impact on innovation. This result essentially resembles the individual impacts of retailer and supplier concentration: Higher retailer concentration tends to increase innovation, whereas higher supplier concentration tends to decrease innovation. Consequently, the measures re-enforce individual impacts. This is not surprising from a technical point of view. However, it must be outlined that the imbalance measure seems to play an important role in some assessments of bargaining power in procurement markets. For example, the German Federal Cartel Office compared concentration levels at the retailer and the supplier level and considered that higher retailer concentration would indicate buyer power, which in turn might lead to adverse effects such as reduced choice and

¹² Possibly with the exception of countries featuring the “highest levels” of retail concentration (see e.g. page 33 of the study).

innovation. Against this background it should be clarified that the empirical evidence runs counter such a hypothesis, at least as far as innovation is concerned.

As indicated above, it appears questionable whether the imbalance indicator provides information above and beyond the effects found for the individual indicators. Yet, if one were to believe that retailer concentration *relative* to supplier concentration provided additional information then higher retailer concentration and lower supplier concentration would tend to foster innovation (not the other way around).

- **d) The EU study suggests that private label penetration at the procurement level has no (negative) impact on choice and innovation:**

As above, this finding may theoretically suggest at least one of two possibilities. First, private label penetration may have no impact on buyer power. Nevertheless, it seems possible that private label penetration may strengthen retailers' bargaining power at least in some instances. To sketch such a theory of harm, in the extreme case, retailers may use private label products as a potential outside option to suppliers' national brands. More gradually, competitive private label products in terms of price and quality will likely exert competitive pressure on national brands in terms prices and quality, respectively. To the extent that private labels are controlled by retailers, therefore, they would strengthen retailers' bargaining positions vis à vis suppliers, at least in some instances.¹³

Second, the question remains as to whether increasing shares of private labels, in such a context, would significantly distort national brand suppliers' incentives to invest in choice and innovation. Given the results and possible interpretations, it seems important to distinguish procurement markets (national level) and local retail markets:

□ **Procurement markets (national level):**

In theory, an increasing share of private labels might have two effects on choice and innovation. On the one hand private label products are by themselves new products; one would therefore expect them to increase choice and innovation. Put differently, private label products may lower barriers to choice and innovation as they may enable choice and innovation without a manufacturer having to engage in marketing efforts and risks. On the other hand, as sketched above, private label products may discourage some investments of national brand producers, thereby reducing choice and innovation. On balance, the introduction or expansion of private label products might be seen as a first-order effect, whereas the reaction of national brand producers is a second-order effect.

As such, since the EU study accounts for choice and innovation of all products including choice and innovation from private labels, one might have expected increasing choice and innovation due to increasing private label shares (e.g. the first-order effect dominating the second order effect).¹⁴ At the procurement level, such a

¹³ Notice that bargaining power is but only one explanation for private label penetration. Below we will discuss how shop format decisions may affect private label penetration (and, indeed, how this relationship may have affected the empirical results of the EU study). Further, private label penetration may be driven by local requests from local independent retailers: We understand that for Edeka, requests from local retailers tend to concern local private label products more often than additional national brands products.

¹⁴ Standard economic models of strategic interaction lend support to a hypothesis of increasing choice and innovation due to the introduction private label products. If choice and innovation (in private and national brands) were strategic complements, then stronger private labels would trigger an expansion of national brands as well. Even if choice and innovation (in private and

hypothesis is supported in terms of choice indicators product supplier variety and product price variety (albeit only weakly so in terms of economic significance).

Interestingly, for the long data series, the EU study finds a strong positive relationship between private label share and the number of (Opus) innovations, whereas for the short data set including Belgium and Hungary the study finds a strong negative relationship; the latter jarring with the hypothesised first-order effect. It is thus possible, that positive effects of private labels only materialise in the longer term, whereas they cannot be detected in the shorter post crises period after 2008. It is also possible that the period after 2008 concerns private label expansion, prevailing at a relatively high share of private labels already, whereby the study found support for a non-linear relationship of private label share and innovations.

In our view, it would have been useful and helpful, had the EU study explored this issue further such that more reliable policy conclusions could have been drawn.

In summary, the EU study does lend empirical support to a hypothesis of increased choice and partly innovation due to higher private label penetration at the procurement level. As such the EU study would obviously not support a presumption of harm and hence any intervention in absence of additional empirical backing due to private label penetration.

□ **Local retail markets:**

At the local retail level, i.e. including variations across shops, the EU study finds negative, albeit economically insignificant, effects on choice as well as negative and economically significant effects on innovation, once a non-linear specification is employed. As these findings could not be established at the national level, they seem to accrue primarily from variations across shops; that is shops with higher private label shares seem to feature fewer innovations than shops with lower private label shares.

Indeed, comparing the shop formats hypermarkets, supermarkets and discounters the EU study finds strong differences of both choice (Figure 153) and innovation (Figure 154) across these formats, with hypermarkets offering more choice and innovation than supermarkets which in turn offer significantly more choice and innovation than discounters. Obviously and not surprisingly, different shop formats go along with different degrees of choice and innovation as well as with different private label intensities.

The EU study does control for the three shop formats hypermarkets, supermarkets and discounters. Hence, to the average extent to which these discrete shop format decisions affect choice and innovation, this is captured by the respective dummy variables - these dummies are indeed both statistically and economically highly significant.

However, in reality, shop format decisions and strategies are no discrete choices among three possible forms but they will vary gradually (as does private label

national brands) were strategic substitutes, and hence private labels would trigger contraction of national brands, then under standard assumptions the contraction effect would be smaller than the expansion of private labels.

penetration across shop types (see Figures 153 and 154)). This means that, to the extent that shop format variations within each category of hypermarket, supermarket and discounter affect choice and innovation, this effect will not be captured by the respective dummy variables. As private label penetration is still likely to vary with shop format variations within each category, the degree to which format variations (within category) affect choice and innovation may partly be associated with private label penetration.¹⁵

Put differently, whilst the EU study finds some negative correlation between private label penetration and the variables of choice and innovation, one should caution to draw causal conclusions. Based on the available information, it appears indeed plausible that retailers determine their format strategies, involving choice, innovation and private label penetration even within categories hypermarket, supermarket and discounter, depending on local competition and preferences. However, since the EU study only controls for the three distinct shop formats, the model may associate the effects that gradual format decisions may have on choice and innovation to the private label variable. This interpretation is supported by the strong impact that format decisions have on choice, innovation and private label penetration as well as by the fact that the study did not find any negative impact of private label penetration at the national procurement level.¹⁶

Therefore, based on our theoretical presumptions and on the published information, we would caution against drawing strong policy conclusions or recommendations with regard to the effect of private label penetration in local retail markets.

5 Concluding remarks

This paper summarises our understanding of the approach and the main findings of the EU study “The economic impact of modern retail on choice and innovation in the EU food sector”.

Important findings of the EU study include:

- The empirical evidence did not suggest that retail concentration (in itself and relative to supplier concentration) had a negative impact on choice and innovation in the EU food sector. This applies both for national procurement markets and local retail markets.
- The empirical evidence did not suggest that private label penetration had a negative impact on choice and innovation on national procurement markets. Some model specifications, however, suggested a negative impact on local retail markets; in other words, shops featuring higher private label penetration would come along with less innovation (fewer new product introductions).

¹⁵ The EU study seems hint towards such correlations, too, on page 225 below Figure 154. See also the issue of unobserved heterogeneity among shops (e.g. under 6.2.1. of the study).

¹⁶ The EU study itself alludes to the possibility of such effects. In particular, the inclusion of the non-linear (quadratic) component into the model specification seemingly leads to a larger negative impact of high private label product shares on innovation. At the same time, however, the negative impact of the hard discounter shop type (which is characterised by high share of private label products and low innovation) is reduced. What was treated as an effect of being a hard discounter (where private label shares are higher) in linear model becomes instead treated as an effect of high private label share in the non-linear model (p. 225).

The econometric study is based on a sample of up to seven MS not including Germany. The analysis is deemed representative for the EU, but for those MS with the highest retailer concentration. The latter do not include Germany. In conclusion, we see no reason to contest this representation; that is, materially, the findings should hold for Germany as much as for the sampled MS.

From a policy perspective, the above reported findings suggest that retailer concentration had either not materially increased retailers' buyer power, or that buyer power had no negative effect on choice and innovation - or both. Similar conclusions can be drawn for private label penetration, as there is no empirical evidence suggesting a negative impact on choice and innovation at the procurement level. The negative impact of private label penetration on innovation, which was found (for some specifications) at the local retail level, suggests that individual shops with higher private label penetration tend to have fewer new product introductions. We note that shops with higher private label penetration may differ in other (unobserved) respects, which may lead to fewer new product introductions.

The EU study addresses important questions, of which - naturally - not all could be answered robustly and/or entirely. Yet, the empirical insights gained are welcome and valuable, if partly for the insights that no robust relationships (neither negative, nor positive) could be found.