9. Simulating the Effect of Oracle's Takeover of PeopleSoft

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The hostile takeover of PeopleSoft by Oracle was not an everyday business transaction. The assessment of the transaction by the European Commission was also a process that was special for a number of reasons. It was an unusually long procedure where the clock was stopped twice.[2] It was also one of the last transactions to be assessed under the old merger regulation.[3] Furthermore, in parallel with the assessment by the Commission, the US Department of Justice asked the District Court in San Francisco to prohibit the transaction and lost.[4] This chapter deals with none of these particularities. Instead it describes the choice of merger simulation model that was developed by DG Competition in the course of the assessment and how it influenced the thinking about the transaction.

The model presented below indicated that the transaction potentially could lead to significant harm to consumers, yet the Commission ultimately decided to clear the transaction. This should not be seen as a general hostility towards merger simulation models, rather it was due to the particular circumstances in this case. The simulation model relied on a narrow definition of the relevant market, whereby the merger could reasonably be described as a strict reduction from three to two players. Relatively late in the procedure, the Commission concluded that it was inappropriate to exclude other players from the relevant market. Since the narrow market definition was perhaps the most fundamental assumption in the model, it could no longer be relied on to predict the effect of the merger. Though the model ultimately had little relevance for the final outcome, it may serve as an illustration of a case where actual modelling potentially can be both possible and useful.

There are many different ways in which the effect of a merger can be modelled. The choices made should to the widest possible extent reflect the particular characteristics of the market in question without compromising the mathematical tractability of the exercise. In this particular case a number of observations regarding the market was informing the choice of model. These

characteristics are described in Section 1. Section 2 outlines the structure of the model and its basic mechanics. In Section 3 some results from the simulation of the merger are shown.

1. MARKET CHARACTERISTICS

Oracle and PeopleSoft were two of many companies active in the part of the software industry that is called Enterprise Application Software (EAS) which provides software that facilitate all the different aspects of corporate activities. One can broadly distinguish between different pillars of software, depending on whether it aims at managing customers (Customer Relationship Management, CRM); staff (Human Resource, HR); transactions (Financial Management Systems, FMS) or input and production (Supply Chain Management, SCM). While some firms provide point-solutions to particular tasks within the firm, both Oracle and PeopleSoft are among the companies providing integrated suites that deliver broad packages of solutions to most or all of the firms needs within a pillar as well as across pillars.

The difficulties in defining the relevant market in this case related inter alia to the fact that customers varied greatly in what kind of software they could use depending on a number of factors including their size, their industry, their internal organization, their global presence etc. At the point in time when the model was developed the Commission worked under the assumption that for large enterprises with complex needs only Oracle, PeopleSoft and SAP were competing for FMS and HR. Yet, for a number of reasons that are mentioned in its final Decision,[5] the Commission ultimately decided that this hypothesis could not be upheld and that the market also contained other firms.

Below a number of characteristics of the market is outlined that informed the Commission when deciding how to model competition in the market. To illustrate different points, references are sometimes made to witness statements from the court trial in California. This is done out of convenience since, contrary to many other types of evidence, the testimonies are in the public domain.

Individual Bidding Process

The procurement process by which large enterprises select their EAS provider takes place in a way that can appropriately be understood as a bidding contest. The customer decides based on individual preferences and other constraints how to structure the process. In many instances it may acquire expert assistance from an independent advisor[6] in the process. The

procurement process usually contains a number of stages including the definition of the scope of the tender and a number of selection criteria as well as negotiation and selection rounds. There does not appear to be a general market-wide practice for how to design the process, rather the process chosen in a given situation appears to be specific to the particular tender and the particular circumstances. In order to take this diversity into account, it is not appropriate to make very detailed assumptions about how the procurement process takes place. It appears more robust to choose a model that is sufficiently generic to take all the variations into account.

Competitors are Known

From internal documents it appeared that in many instances each bidder becomes aware of the identity of its competitors in a particular bidding contest before they decide on their final offer. Discount approval forms from Oracle very often contained references to the identities of other bidders in the contest. Similarly PeopleSoft had submitted bidding data to the Commission indicating the identity of their competitors in given bidding situations.

Most Cost are Sunk Before the Bidding Contest

The main cost components of an EAS supplier are the development of the software and the sales and marketing activities. These types of cost are all incurred by the EAS supplier prior to the entering into a contract. This is confirmed for instance by the testimony of Ms Catz (one of the two presidents at Oracle) before the District Court in California. When asked about Oracle's gross margin, she replied:

> …on a million-dollar deal for example, regardless of what the software is, I might have to send a CD pack or a few CDs to the customer. That would cost maybe $30. Many of our customers don't ask for a CD pack because they download the software from our web sites or they already have it in-house. In addition, I have to pay commissions to my salesmen. And depending on which product line, the commissions for – including the salesmen and the sales manager and all the way up would be anywhere from six percent to maximum nine or ten percent. So, from a million dollars, from a million-dollar deal, $900,000 or so drops to the bottom line, maybe more.[7]

This is different from many other industries where most of the costs of delivering the services are incurred after the bidding contest. As an example, in procurement contracts for cleaning services the main part of the costs of delivering the services are not known at the start of the bidding. This is an important distinction since in most existing models of procurement bidding

markets the uncertainty about future costs forms a very central component of the competitive process.[8]

In addition to the licence fee that is paid up front, the customer can also purchase subsequent maintenance of the software, including updates and patches that repair bugs when identified. The price for the maintenance is usually decided as a fixed annual fee calculated as an agreed percentage of the licence fee. The costs related to deliver these services are unknown at the point of bidding (as is the exact content of the service), but it appears reasonable to assume that the costs of providing the updates have to be incurred regardless of whether a particular bid for a particular customer is won or not. This means that these costs, though uncertain at the point of the procurement, should not be considered as marginal costs and are therefore not important for the model.

It therefore appears to be a reasonable starting point to understand a particular bidding contest as one involving zero marginal cost. It should be noted that this assumption is not an exact replication of the facts in that it ignores some adaptations of the software to the particular needs of the customer. Most of the costs related to those kind of services are offered either by the consulting arm of the suppliers or by third parties awarded via separate contracts, often on a per hour basis.[9] Winning a software contract may thus have an add-on impact on the consultation arm of the firm, which is not taken into account.

Each Contest is Unique; Relative Fit of Each Alternative is Uncertain

The requirements of each customer are highly dependent on the particular way the company is organized. This makes the identification of the best technical solution for the customer a complex process in which the software providers invest significant resources. While the bidder appears in most cases to have reliable knowledge about the identity of the competitors in the market, each bidder has less reliable information about how much better (or worse) its proposed solution fits the needs of the customer compared to the competitor's offer. During the tender process the supplier will get a certain feel for the needs of the customer, and perhaps also some ideas about what the competitors are offering. But throughout the process the customer will have an incentive to put pressure on each competitor by "exaggerating" the quality of the available alternatives. Such pressure, if successful, will lead to either lower prices or higher quality in the offer by the bidder. When submitting the "final bid" the supplier does not know for sure exactly what reduction is necessary to win the deal. This uncertainty stems both from the lack of knowledge of the prices from other bidders but also from the lack of knowledge about how much the bidder is willing to pay extra for a better fit.

Ms Catz's testimony illustrates this, when during cross examination she discusses what is known to Oracle and what is not:

> … I think we would love to know how our customers value our product versus our competitors' products, we would love to know that, but we could not possibly know that, because they're not going to tell us. So we're going to look, you know – we're going to try to do our best to learn as much as we possibly can, and if they share with you, they'll share with us something, but they're negotiating with us. So they're not that motivated to tell us everything, and to tell us everything exactly right.[10]

2.   THE MODEL

Based on the above observations the Commission designed a model to best capture the potential effect on prices of the proposed merger. A model must necessarily be based on a certain number of simplifications and assumptions. It will not be able to exactly predict the effect in any particular bidding process, but to the extent that it captures the essential characteristics of the market, it can be seen as a good approximation of the average effect of the proposed merger. The model chosen was a sealed bid auction model with a relatively simple information structure. The model has one stage in which the customer receives a sealed bid from each of the three potential suppliers. The customer then compares the three prices with the value (or quality) he attaches to each of the three products. Exactly what quality he attaches to each of the three offers is individual to that particular customer and is unknown to the bidders. Though the bidders do not know exactly what the quality of each of the bids will be, they have an idea of the range. Formally, it is assumed that the actual quality of each bidder's offer is private information to the customer, but is drawn from a normal distribution with a commonly known mean and standard deviation. Quality in this context should be understood very broadly as to also include the customer's expectations about how the supplier will behave in the future (in terms of providing maintenance, new relevant innovations etc.).

Based on these expectations about the quality of each of the three products the bidders have to decide on what price to ask for the product. It is assumed that this price is selected in order to maximize the expected profit for the bidder. The simulation model illustrates the fundamental trade-off that a vendor is facing when deciding what price to offer to the customer in a situation of imperfect information. A high price increases the risk that the vendor will not be chosen by the customer but at the same time will result in a big profit if he is, while a low price will increase the probability of being selected but result in a lower profit.

The importance of trying to find out about the preferences of the customer in order to optimize the bidding strategy is illustrated inter alia by the testimony of Mr Wolfe, the CIO of the state of North Dakota. He testified about the behaviour of Oracle and PeopleSoft when they were left as the two final bidders in a competition:

> …they both did what they could to determine where the evaluation process was and how they were ranking. Oracle in particular were very aggressive about trying to find out how the evaluation was going, how they stood, and what their ranking was and what the comparisons were with PeopleSoft.[11]

The same point was also dealt with by Ms Catz, when explaining what information the sales representatives extract during the sales process:

> Well, what they learn often is what the customer tells them about what modules and functionality and features they're looking at. What the customers don't tell them, though, is how they value the different differences between our different products and the features, and in fact, as you know, I have been here, and I've noticed that none of the customers wanted to actually share their actual TCO[12] and internal valuation numbers because they actually said they didn't want the vendors to find out.[13]

The model has an implicit assumption that neither of the bidders have any private information about the relative performance of their software compared to that of the competitors.[14] This assumption greatly simplifies the tractability of the model.

Sealed Bid Versus an Open English Auction

The main model choice was to use a sealed bid auction model.[15] Though the entire procurement process may involve a number of selection and negotiation stages, one should not immediately draw the conclusion that a sequential English auction model is the most appropriate way of capturing the competitive process.

The key in this context is rather whether bidders can expect always to be given the chance to respond with an improved offer if they are on the verge of being eliminated from the contest, or whether they risk being eliminated even before they have reached their pain threshold in terms of how low they would go on prices. In an English auction a bidder stays in the race until the price offered by a competitor is so low that he becomes impossible to beat without losing money. In a sealed bid auction, each bidder may actually regret after the contest is over that he did not give a lower bid.[16]

Since marginal costs were negligible, the English auction model would predict that losers would bid all the way down close to zero, and that rarely

appeared to be the case. Rather what appeared to be the case was that sometimes bidders were eliminated because their bids were too high, which would be consistent with a sealed bid model.

The sealed bid model should not be seen as an attempt to mimic the final round of a long procurement procedure only, but rather as a simplified approximation of the entire bidding process. This is important because it would be inappropriate to ignore the part of the competitive process that takes place prior to the final round. Customers also extract benefits from the competition among bidders earlier in the process, where bidders risk being eliminated if the quality of their offer or the (preliminary) price they ask is not satisfactory. The fact that the competitive pressure does affect the price that a customer can obtain even when it does not result in a direct bidding contest was provided by Mr Wesson, the CIO from the largest owner and operator of apartment buildings in the US, AIMCO. He explained in the US Court proceedings how AIMCO had obtained a very substantial discount from PeopleSoft (70 per cent) in return for closing the deal very fast.[17] Such a deal would appear to have only one competitors in the final round, but it is unlikely that AIMCO could have obtained a similar discount absent a significant competitive pressure on PeopleSoft as represented in a model including bids from all market participants.

Furthermore, the elimination of one bidder before the final round cannot always be considered a final decision. So bidders in the final round may be more compelled to offer an attractive price if they perceive a risk that too high a price offer may lead the customer to reconsider previously eliminated options. In the US trial Mr Cichanowicz, Vice President of Business Systems Integration for Nextel testified that they had not invited SAP into the final round but stipulated:

> we felt, though, that the fact that there were three viable alternatives out there still gave us an opportunity to look at SAP, if, in fact, negotiations would fall apart with PeopleSoft or Oracle.[18]

It would not be possible to account explicitly for all these different types of procedural details in the model. In general, what appeared to be the case was that the buyer could or would not commit to a fixed selling procedure and could not credibly commit to transfer information to the bidders. In such a context a sealed bid model seems to be an attractive way to capture the general uncertainty that bidders are facing.

Costumer Surplus or Quality Adjusted Prices?

In many cases the effect of a merger is described by the effect on prices, possibly adjusted for changes in quality. In the context of this particular

model, it is possible to calculate directly the effect on costumer surplus.[19] This is because the model includes specific assumptions about the quality of the product and thus captures the actual value of a transaction for the customer. The distinction between these two measures became particularly important because the merger would lead to the elimination of the PeopleSoft product from the market.[20] The loss of variety would thus not show up in a quality adjusted price measure, but only when measuring customer surplus.

The Commission formed the view that it would be incomplete only to restrict attention to the effect on prices. The risk of restricting attention only to prices can be illustrated by an example. Imagine a market with only three restaurants where two are very close substitutes (say McDonalds and Burger King) and the third is distinct from the other two (say a Chinese restaurant). One would expect two burger restaurants to compete aggressively and have very low prices compared to the Chinese restaurant. If Burger King bought the Chinese restaurant and closed it down, this would likely lead to no (or very little) effect on prices and probably even a reduction in the average price paid for a meal, but significant harm to those consumers who prior to the transaction preferred the Chinese alternative.

To focus on the effect on consumer surplus due to loss of choice only makes sense if one applies a consumer surplus standard understood as the consumers in the relevant antitrust market. The fact that Oracle stops developing a new PeopleSoft product of course leads to fixed cost savings that would have to be included in a total surplus assessment. The fact that efficiencies are only taken into account if they are passed on to the consumers illustrates that this is an area where the consumer surplus standard bites.

Efficiencies

The predicted prices in the model will depend on what is assumed initially about the average quality (monetary value to the customer) of Oracle's, SAP's and PeopleSoft's software solutions as well as the uncertainty about this value for the bidders prior to the issuing of the final bid. To predict the effect of the merger, it is also necessary to assume what will happen to the average quality of Oracle's software once it has acquired PeopleSoft.

The acquisition of PeopleSoft's know-how and source code may allow Oracle to enhance its own product. Oracle argued that it would be able to combine the complementary strengths of the two products' offerings after the merger to put an even better offer on the market. In particular, though this process requires rewriting the source code, it may be easier to do it with PeopleSoft's staff than from scratch. It is difficult to assess whether this effect will be of any significance, in particular in light of the countervailing

integration costs that must also be incurred in order to be able to offer a new product that is compatible with the previous products of both PeopleSoft and Oracle. The simulations below offers both scenarios where the only effect of the transaction is that PeopleSoft's product disappears and scenarios in which the acquisition of PeopleSoft will allow Oracle to improve its quality.

The model does not address in an integrated way, how the merger may affect the incentives to innovate in the industry. Such an analysis would likely show that the increased market share of both Oracle and SAP would lead to improved incentives to offer add-on innovations to its existing customer base, but decreased incentives to offer new products that would cannibalize existing contracts.

3.   RESULTS

Based on assumptions about the parameters in the model – the average quality and uncertainty about the actual quality for each of the three suppliers – it is possible to predict how each bidder will bid in a particular context as well as the probability that the customer will pick each of the three. The bidding prices, the average payment by the customer and the expected utility derived from the contract can then be calculated.

For a given level of uncertainty the quality parameters can be adjusted to produce market shares that correspond to the observed situation prior to the merger. Once the calibration is done, the model can then predict how the disappearance of PeopleSoft will affect the bidding behaviour of Oracle and SAP as well as estimating the impact on average prices and costumer surplus.

The results presented below are split into three scenarios. In the first scenario, it is assumed that the quality of the three products prior to the merger are identical. This serves as a baseline. In the next section it is assumed that SAP's and PeopleSoft's products are of a higher quality than Oracle's. This is done so as to reflect the conditions in a bidding contest for an HR solution, where SAP and PeopleSoft appear to have a higher market share than Oracle. In the third section it is assumed that SAP has a product that has a higher quality than Oracle and PeopleSoft. This is done so as to reflect the conditions in bidding contests for FMS suites, where SAP appears to have a stronger market position than the two others. Throughout it is assumed that the uncertainty is symmetric for the three products.

A Symmetric Case (Baseline)

A reasonable starting point would be to analyse the case where all three products are of equal average value and the inherent uncertainty is the same

for all products. The exact outcome of a merger will depend on how much uncertainty is related to the actual value of the three offers. Table 9.1 below illustrates the results of a base scenario under different degrees of uncertainty.

Table 9.1 Effect of merger baseline (symmetric case; quality = 1)

st.dev	0.1	0.2	0.3	0.4	0.5	0.6	0.8	1
Prices								
post-merger	0.18	0.35	0.52	0.64	0.72	0.79	0.93	1.06
pre-merger	0.12	0.24	0.35	0.47	0.58	0.67	0.84	0.99
Effect (%)	50.0	50.0	48.0	35.5	23.8	16.8	10.3	7.6
Probability of sale (%)								
post-merger	100	100	99.68	96.63	91.80	86.89	79	72.38
pre-merger	100	100	100	99.92	99.19	97.46	93	87.83
Effect (%)	0.0	0.0	•0.3	•3.3	•7.5	•10.8	•15.1	•17.6
Consumer surplus								
post-merger	0.88	0.76	0.64	0.59	0.58	0.58	0.60	0.63
pre-merger	0.97	0.93	0.90	0.87	0.84	0.84	0.86	0.90
Effect (%)	•9.0	•18.7	•28.3	•31.9	•31.5	•30.6	•29.7	•29.4

Table 9.1 shows that a reduction in the number of players may have a very substantial effect on both prices and consumer surplus. Each column shows the result of the simulations under one set of assumptions regarding the average uncertainty. All prices in the table are expressed with reference to the average quality.[21] In the first column the assumption is that the uncertainty (measured as the standard deviation of the quality) is 0.1 or equal to 10 per cent of the average value. In this case the bidders would all ask 12 per cent of the average value prior to the merger but 18 per cent after the merger. This would correspond to an increase in the price of 50 per cent.[22]

Since the customer in both cases will derive the lion's share of the benefits from the transaction, the effect of consumer surplus is more modest (9 per cent). It should be noted that the consumer surplus not only measures the loss due to higher prices, but also captures the loss due to reduced choice. In those instances where PeopleSoft's solution would have been the preferred solution by the customer, there would be a loss, even if the second-best solution had been available at the same price.

The effect on prices (measured relatively) is most substantial when there is little uncertainty, but as uncertainty increases (towards the right in the table) the loss in consumer surplus becomes more and more important, rising to around 30 per cent. When uncertainty increases the suppliers will have an incentive to increase their prices, which leads to a decrease in the probability

of a sale actually occurring. This would be the case if all three bids turned out to be less valuable to the customer than the prices submitted.

The probability of a sale actually occurring will decrease after the merger due to a combination of two effects. First the prices asked by each bidder will be higher after the merger. This increases the probability that none of the offers will bring a positive net benefit to the customer. But even if prices remained unchanged after the merger, the probability of sales would decrease due to the second effect, which stems from the fact that the probability of sales is based on the joint probability that at least one of the bids will provide positive net benefits. The probability that at least one solution out of three is satisfactory exceeds the probability of at least one of two.

Calibration

A situation in the model where no sale occurs would in the real world correspond to the situation where the bidder, based on the submitted offers, decides either to postpone the acquisition or find a solution outside the relevant market. From the market investigation it was established that it sometimes happens in actual bidding contests. This makes it possible to calibrate the level of uncertainty in the model so as to correspond to a realistic frequency of a sale not taking place.

The Commission had no quantitative evidence available regarding how often the customers actually decide not to buy. But it appeared reasonable to assume that this event is rare, though not extremely rare (i.e. it occurs with a frequency between 0.01 per cent and 10 per cent of the tenders). The level of uncertainty in the model could thus be bounded to an interval that produces probabilities of sales corresponds to this range. In the case of symmetric bidders the appropriate interval for the standard deviation can be delineated from 0.2 to 0.6. Below this interval an actual sale happens virtually always, whereas above this interval the probability of a sale drops well below 90 per cent.[23]

Based on the above, it is fair to conclude that in the above scenario a merger from three to two in a market with three equally strong suppliers is likely to lead to significant price increases as well as substantial loss in consumer welfare absent substantial efficiencies.

First Asymmetric Case (Resembles HR)

The effect of the merger will to a certain extent depend on the relative strength of the product that is taken off the market and the products that remain. Historically PeopleSoft has enjoyed a relatively strong position within HR compared to the other pillars. Below is analysed whether the

conclusion from the symmetric case also holds for an asymmetric case designed broadly to capture the market conditions with regards to tenders for HR suites.

Each column represents a simulation in which the quality of SAP and PeopleSoft has been normalized to one while Oracle's quality has been adjusted in order to arrive at a distribution of market shares where Oracle holds 12 per cent of the sales prior to the merger.

As in the case above, it is assumed that Oracle after the merger will stop actively selling PeopleSoft's product but instead sell one Oracle-based product. The effect of the merger depends on what is assumed about the quality of the new Oracle-based product. Two scenarios are considered: one in which Oracle's product in the future will be unaffected by the merger (pessimistic scenario) and one in which Oracle will be able to recode the Oracle HR suite so it reaches the same level of quality of PeopleSoft's product (optimistic scenario). In principle the optimistic scenario would require that the Commission were to find Oracle's claimed efficiencies substantiated to the requisite standard.[24]

Table 9.2 Effect of merger in HR (quality of SAP and PS=1)

St.dev.	0.1	0.2	0.3	0.4	0.5	0.6	1
Quality of Oracle	0.886	0.772	0.658	0.5475	0.45	0.3635	0.05
MS Oracle (%)	12.0	12.0	12.0	12.0	12.0	12.0	12.1
Effects on price (%)							
Pessimistic	48.6	48.5	39.4	21.1	11.3	6.8	1.5
Optimistic	37.5	37.5	35.7	25.5	17.9	14.1	9.0
Probability of sale (%)							
Pre-merger	100	100	100	99.5	97.2	93.7	80.5
Effect on consumer surplus (%)							
Pessimistic	-12.1	-26.2	-37.8	-39.0	-38.2	-37.8	-38.1
Optimistic	-5.5	-12.0	-18.6	-19.2	-17.0	-15.5	-13.5

Table 9.2 illustrates the effects of no longer promoting PeopleSoft in new competitions for HR pillars. Again, if the probability of sale pre-merger is used as indicator for the range of most likely level of uncertainty, a range from 0.3 to 0.6 appears to be reasonable. Throughout the realistic range of uncertainties, the loss in consumer welfare will be significant even in the most optimistic scenario. When the uncertainty is in the high end of this interval, the price increase will be 6.8 per cent in the pessimistic scenario and 14.1 per cent in the optimistic scenario.[25] Due to the reduction in choice, the consumer welfare will be reduced by 15.5 per cent even in the optimistic scenario, whereas the loss will be 37.8 per cent in the pessimistic scenario. In

the other end of the range, when uncertainty is low (st.dev.=0.3) the increase in prices will be 35.7 per cent in the optimistic scenario and 39.4 per cent in the pessimistic scenario. Though the increase in prices is higher for low uncertainty, it is on tha back of relatively low price levels. The negative effect on consumer surplus of 18.6/37.8 per cent in the optimistic/pessimistic case are thus comparable to those found under high uncertainty.

Second Asymmetric Case (Resembles FMS)

While the situation in the market for HR solutions appeared to have two competitors of roughly equal strength and one relatively weaker offer, the FMS market appears to be characterized by one particularly strong supplier (SAP) and two less strong suppliers (Oracle and PeopleSoft). Below the effect on consumers in such a market situation when the two less strong competitors merge is simulated.

Each column contains a simulation for a particular standard deviation in which the quality has been adjusted to allow the market share of Oracle and PeopleSoft pre-merger to be around 15 per cent. The probability of sale in the pre-merger scenario appears to be in the realistic range if the standard deviation is kept between 0.3 and 0.5.

Table 9.3 Effect of merger in FMS (quality of SAP=1)

St.dev.	0.1	0.2	0.3	0.4	0.5	0.6	1
Quality of Or. and PS	0.842	0.685	0.528	0.405	0.308	0.217	n.a.[26]
MS Oracle and PS (%)	15.0	15.1	15.0	15.0	15.0	15.0	
Effect on price (%)							
No efficiencies	41.9	41.9	29.9	18.5	14.3	12.1	
10 % efficiencies	27.3	34.8	28.0	17.8	13.9	11.9	
Probability of sale (%)							
Pre-merger	100	100	99.72	95.88	89.64	83.51	
Effect on Consumer surplus (%)							
No efficiencies	•8.1	•19.3	•25.2	•21.4	•19.2	•18.1	
10 % efficiencies	•2.5	•13.8	•21.8	•19.3	•17.9	•17.3	

The effect on price and consumer surplus in each column has been considered under two possible scenarios: one in which the merger does not create any synergies and one in which the merger would allow Oracle to improve the quality of their product by 10 per cent.

Table 9.3 shows that in the relevant range the merger is likely to increase prices significantly (14.3–29.9 per cent without efficiencies and 13.9–28.0 per cent with efficiencies). Similarly the merger would significantly reduce

consumer surplus (19.2–25.2 per cent without efficiencies and 17.9–21.8 per cent with efficiencies). Based on this it is fair to conclude that in the market for FMS the merger will significantly harm consumers, even with substantial efficiencies.

Model Fit

Compared to other models this one did not rely on a large number of quantitative data. That could be perceived as a weakness by some. Since the cost side of the model is irrelevant, the most obvious absence of data is on the demand side.

But from the lack of extensive data requirements it does not necessarily follow that the model does not adequately take the characteristics of the market into account. On the contrary the model was tailor-made to take account of a number of particular qualitative characteristics of the particular market in question.

In addition, the model does capture a number of existing patterns observed in the market. SAP is widely perceived to have the highest prices. The model predicts that the bidder with the highest market share (SAP) is also the bidder that on average submits the highest price. Though prices in this market is inherently difficult to compare, some of the estimates that were mentioned in expert reports appeared to be fairly in line with what the simulation models reproduced.[27]

Furthermore, as already mentioned, the model predicts that some customers decide not to buy from any of the suppliers. Other models based on other sets of assumptions would not produce the same results and would therefore be less suitable for predicting the effect of the transaction in this particular case.

Finally, the model predicts that customers who generally attach a high value to the software[28] will pay a higher price than a customer that generally attaches low value to it. This corresponds to the fact that the pricing structures chosen by each of the suppliers appear to be designed primarily to reflect the utility of the product to the customer. Pricing is therefore often linked to proxies for the value of the software to the user such as the number of users or the intensity of the usage of the application.

4.   CONCLUSION

A number of circumstances particular to the software industry made it possible to simulate the effects of the merger in a model that was both tractable and a reasonable approximation of how competition works. The fact

that marginal costs can be ignored and that what constrains bidders is essentially uncertainty about customers' relative valuations, minimizes the need for data both on the supply and demand side.

In the guidelines for horizontal mergers, the Commission put quite some emphasis on the need to establish closeness of substitution in mergers with differentiated goods. The model illustrated that when a product is likely to disappear after the merger, the role of closeness of substitution takes a different role.[29] If the merger is between close substitutes[30] the effect on price may be high, but the loss of choice from removing one of them will be low. If, on the other hand, they are distant substitutes then the effect of removing one of them depends on whether the remaining competitor's product is close to the product that stays in the market or the one that disappears. In the first case,[31] consumers will be harmed mainly due to the loss of choice, while in the latter[32] the harm will mainly be due to higher prices.

Had the Commission found that the relevant market only contained Oracle, SAP and PeopleSoft, it would be fair to say that the model for realistic calibrations predicts a significant decrease in consumer welfare. In all instances where there are no efficiencies due to the merger, the loss would likely exceed 18 per cent. Even if the merger would lead to moderate efficiencies for the new combined product, the merger would still lead to a loss in consumer welfare in excess of 10 per cent.

NOTES

1. The views expressed in this article are personal and do not necessarily reflect those of the Chief Economist, DG Competition, the Competition Commissioner or the Commission.
2. The transaction was notified on 14/10/2003 and a clearance decision with no commitments issued on 26/10/2004.
3. Council Regulation (EEC) No 4064/89 of 21 December 1989 on the control of concentrations between undertakings.
4. US District Court for the Northern District of California. United States et al. versus Oracle Corp. Opinion handed down by Judge Walker on 09/09/2004.
5. See M.3216 – ORACLE / PEOPLESOFT art. 8(2) Decision of 26.10.2004 Section IV.A.3.
6. Such as for instance Accenture, Cap Gemini, Ernst & Young, Deloitte, IBM Global Services or Bearing Point etc.
7. 3460:24-3461:10 of the transcript of the US court trial.
8. See for instance Dalkir, Logan and Masson (2000) and Waehrer and Perry (2003).
9. One exception is where the development of a particular solution to an identified need has strategic value for the supplier. This would be the case where the supplier believes that the particular solution could subsequently be sold as a core solution to future customers. In such contexts the suppliers may enter into a joint development project in which they share the cost and risks of developing the solution in return for subsequent ownership rights.
10. 3517:25-3118:9.
11. 1560:8-15
12. TCO means Total Cost of Ownership
13. 3518:23-25.

14. Technically, the assumptions are: no private information and common priors about the relative performance of the three offers.
15. How the assumption of whether bidding takes place via sealed bids or in an oral auction is analysed in Tschantz, Crooke and Froeb (2000).
16. Generally, open auctions are believed to have superior efficiency properties, because they always allocate the contract to the best supplier.
17. PeopleSoft wanted to close the deal fast in order to be able to include the deal in the sales for that particular quarter.
18. 1068:13-17.
19. Customer surplus is a better term in this context than consumer surplus. Since the software purchase is essentially a fixed cost, the effect on customers in the antitrust market in question is unlikely to be passed on in a straightforward way to the final consumers. The consumer surplus measure applied in this case comprises the monetary gain that the customers extract from the trade in the antitrust market in question.
20. Oracle had publicly announced that they would continue to support PeopleSoft customers, but seize to sell the product actively. See for instance the Oracle Press release from June 20 2003 "Oracle Makes Public Commitment to PeopleSoft Customers". In this context it should be noted that what is important for the modelling is not whether Oracle in future bidding rounds will offer a solution under the name Oracle or PeopleSoft or whether it will consist of a source code from one or the other of the existing products. For the purpose of simulating the effect of the merger the central assumption is that in the future, Oracle will provide one and not two alternative solutions (one PeopleSoft and one Oracle) which will be priced as if they were in competition with each other.
21. In asymmetric simulations, the average quality of one firm (say SAP) is normalized to 1.
22. Table 9.1 shows that generally low levels of uncertainty result in low levels of prices. When the standard deviation is 1, the prices are close to 1, whereas when the standard deviation is 0.1 the prices are less than 0.1. This illustrates that the intensity of competition is dependent on certainty. If there were no uncertainty in the model (standard deviation goes to 0) and no asymmetry between the bidders (as in this example), then prices would be 0 even with only two bidders as is the case in traditional Bertrand competition.
23. The pre-merger probability is the relevant one for comparing with the observation that historically it has sometimes happened that a sale does not occur.
24. See Section VII of the "Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertaking" Official Journal C 31, 05.02.2004, pages 5–18. It should be noted that the Guidelines in principle only apply for the new merger regulation, which had not yet entered into force.
25. For large values of the standard deviation, the average price will be higher in the optimistic scenario than in the pessimistic scenario. The opposite is the case for low values of the standard deviation. In the optimistic scenario the higher average quality of Oracle will have two effects: it will put pressure on SAP to lower its price and it will also lead Oracle to charge higher prices. The higher the uncertainty, the stronger is the latter effect. It should be noted that the prices are not quality adjusted. Since the higher prices by Oracle correspond to a higher quality, consumers will prefer the optimistic scenario regardless of the level of uncertainty (cf. the effect on consumer surplus).
26. This simulation has not been performed because it would require the assumption of negative quality on average. Such assumptions did not appear realistic.
27. Had reliable price information been available, the calibration could have been further refined by allowing each product to have a different uncertainty attached to it. That would allow the model to replicate both observed market shares and prices.
28. In terms of having high average valuations of the software packages.
29. In many instances the potential reduction in choice may not be a source of concern because one can reasonable rely on firms to provide the range of products that consumers want.
30. Which would correspond to Burger King and MacDonalds merging.
31. Which would correspond to a Burger King buying the Chinese restaurant and closing it.
32. Which would correspond to the Chinese restaurant bying Burger King and closing it.