

## **Appendix I - A review of the literature on the ex-post assessment of merger decision**

I.1 In this Appendix we review the economic literature on the subject of ex-post review of the effectiveness of competition law enforcement, and in particular of ex-ante merger control rules.

### **I.1 The debate spurred by the Crandall-Winston paper**

I.2 Much of the recent debate on the need to perform an ex-post assessment of the effectiveness of the antitrust law enforcement has been spurred by a provocative paper by Crandall and Winston (2003). In this paper the authors offer a rather pessimistic view on the impact of the US antitrust policy on consumer welfare. Crandall and Winston review some literature on monopolization, collusion, and mergers enforcement and conclude that in all these areas the effect for consumers has been negative.

I.3 Their assessment of the welfare consequences of the enforcement of the merger control regulation in the US is largely based on a model in which price-cost margins in 20 manufacturing industries are regressed over court-based outcomes (successful challenges, unsuccessful challenges and consent decrees), second request for information and industry characteristics such as import-sales ratio (to control for foreign competition), capital-sales ratio (to control for technology), and the growth of the number of firms with a five-year lag (to control for entry).

I.4 Their model shows that a successful merger challenge has a negative, but statistically insignificant, effect on the price cost margin, whereas an unsuccessful challenge is associated with a decline in price-cost margins. This effect is statistically significant. Crandall and Winston interpret these results as indicating that the mergers blocked by the US antitrust authorities do not have significant effects on price-cost margins, because the enforcement agencies are not able to sort out beneficial mergers from harmful ones. They also find that consent decrees are associated with an increase in the price-cost margins. This seems to indicate that the antitrust authorities were not able to negotiate conditions that were sufficient to address all the potential competitive problems raised by a merger.

I.5 The point of view of Crandall and Winston is effectively contrasted by Baker (2003) who argues that, even if it is difficult to determine with

precision the costs and benefits of antitrust enforcement, overall the benefits to consumer and social welfare seem likely to be larger than the costs.

- I.6 With respect to mergers, Baker points out that evaluating the actions of antitrust authorities in merger cases is difficult as a simple comparison over time does not provide useful information on the impact of the antitrust agency's decisions. However, starting from Eckbo (1983) and Stillman (1983), a large body of literature has looked at financial markets as a source of information to evaluate merger control (see among others Eckbo and Wier 1985; McAfee and Williams, 1988; Schumann, 1993; Simpson, 2001).
- I.7 Baker also reports a study by the Federal Trade Commission (FTC) staff on small mergers that are not reported in advance and that can only be reviewed and challenged ex post. The study concerns some consummated soft drink bottling mergers. It finds that the acquisition of horizontal rivals on average led prices to rise 3.5% for small mergers and 12.8% for larger ones (Saltzman et. al, 1999). This evidence, however, shows only that some mergers may in fact determine anticompetitive effects, resulting in higher prices and lower consumer welfare. It does not provide any information on whether the enforcement of the merger regulation is apt to pick up these mergers and distinguish them from those that do not cause anticompetitive effects.

## **I.2 Recent works on the use of event studies**

- I.8 Duso, Neven and Röller (2006) and Duso, Gugler, and Yurtoglu (2006a, 2006b) provide a broad overview of the event-studies literature and discussed its advantages as well as drawbacks and difficulties. Both papers apply an event-study methodology to a sample of 167 mergers analyzed by the European Commission between 1990 and 2002 to assess its decisions. They base their analysis on the robust prediction from several theoretical models of oligopolistic competition (Cournot, Bertrand with differentiated goods, dominant firm) that consumers' surplus after the merger shall be reduced if the competitors to the merging firms increase their profits. By using event studies around the merger's announcement date, they measure the change in rivals' profits accruing to the merger and, hence, they get a proxy for the competitive nature of the deal.
- I.9 One advantage of these studies is that the effective competitors are clearly identified since they use the product market definition as reported

by the EU Commission's official decisions. In fact, the typical fallacy of the previous literature was to use the industry as defined by SIC codes to define competitors. Yet, product markets most commonly differ from industries as defined by standard classification methods

- I.10 Duso, Neven, and Röller (2006) inquire whether the Commission committed any mistake in their assessments and whether these mistakes were systematic. One should observe a decision by the Commission to intervene over a proposed merger only in those cases in which the market believes that the transaction is anticompetitive, i.e. where the rivals' profits increase after the merger. If this is not the case, one can define situations where the market and the Commission assessments diverged, which are considered to be "errors". Type I errors occur when a pro-competitive mergers is unduly blocked or modified through conditions and Type II errors occur when an anticompetitive mergers is unconditionally cleared. In a second step the determinants of such mistakes are explored by means of regression analysis. The lobbying activities of merging and rival firms, procedural issues such as whether the merger is cleared in phase I, geographical and product market definitions, and the countries of provenience of the merging firms are considered as possible sources of bias in the Commission's decision.
- I.11 They find that firms' lobbying is not a significant determinant of the errors, while institutional lobbying (the country effects) as well as procedural issues significantly explain the probability of such mistakes.
- I.12 Duso, Gugler, and Yurtoglu (2006b) go one step further and propose to look at firms' abnormal returns around the Commission's decision date, in order to identify the effectiveness of the decision. First of all they tackle the problem of markets' expectations about the Commission's action. They consider that the stock market reactions around the decision date represent the update of the market assessment of the overall effect of the merger, once the uncertainty about the decision is resolved. They show that, by using a correction for the expected probability of a Commission's action, it is possible to identify the real effect of the announced decision on firms' profit. Once this problem is solved, the logic of the proposed methodology is the following. If the merger is anticompetitive, rivals' profits increase around the day of the merger's announcement. If then the competition authority's decision is effective in restoring competition, one should also expect negative abnormal returns for the rivals around the day the decision is announced. In particular, one should expect a minus one

coefficient of the regression between announcement day abnormal returns and decision day abnormal returns. This is due to the fact that all the anticompetitive rents accruing to the rivals because of the merger should be eliminated by a correct and effective antitrust decision.

- I.13 They show that this prediction is met for prohibition decisions, which reassures on the reliability of the adopted approach. They also show that the remedies imposed by the Commission are not always effective in solving the competitive concerns, at least not on average. Nevertheless, both structural (divestitures) and behavioral remedies do help restore effective competition when correctly applied to anticompetitive mergers during the first investigation phase. Yet, they are on the whole ineffective or even detrimental when applied after the second investigation phase. Finally, to underline the robustness of their approach and results, they apply a second methodology based on (balance sheet) profitability effects two years after the merger to estimate the merger's effects, and show that the results are consistent.

### **I.3 Studies based on balance-sheet data**

- I.14 An alternative approach to evaluate mergers' effects is based on the use of balance-sheet data. The literature that uses this approach is still very limited: the paper by Gugler et al. (2003) is its most recent example<sup>1</sup>. The approach used in this paper makes use of balance sheet data on sales, assets and profits to identify the effects of a merger and categorizes mergers as anticompetitive, when they increase the profit of merging firms, while simultaneously decreasing their sales. The authors use a large panel of data on mergers over a time period of 15 years and compare the development of the profit and sales level of merging firms with those of a control group of non-merging firms. After categorizing the mergers in market power increasing, efficiency increasing and efficiency decreasing, they consider how merger specific characteristic, such as the type of industry, the size of the merging firms, and the nature of the merger affect the post-merger market outcome.
- I.15 Given their empirical tractability, these methodologies are particularly useful when evaluating a large number of mergers and competition policy decisions simultaneously. However, they have the major drawback of not being able to shed light on the specific nature of the market interactions after the merger.

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<sup>1</sup> This paper contains also references to some older literature, but this is quite limited.

- I.16 Balance-sheet data can also be useful when doing policy evaluations, to extract information about the variable of interests (e.g. profits, R&D expenditures, rate of return, and total value of the assets) or about the exogenous covariates (see Box 2.2. in Chapter 2). In addition, balance sheet data can be used to understand the nature and structure of a market ,exactly as with survey data.

#### **I.4 Structural models**

- I.17 Another approach to measure mergers effects, which is much more tailored to the specific structure of the market where the deal should or did take place, is the estimation of structural models. Some relevant examples of this approach to evaluate mergers are Nevo (2000), Ivaldi and Verboven (2001), Pinske and Slade (2004), and Slade (2004).
- I.18 In Nevo (2000) a brand-level demand system for ready-to-eat cereals is estimated as a function of the product characteristics and consumer preferences using supermarket scanner data. After assuming a pure strategy Bertrand-Nash equilibrium in prices (which was supported by the findings in Nevo, 2001), marginal costs are recovered from the demand estimates. Using the estimated demand parameters and marginal costs, several post-merger equilibria are then simulated under different assumptions about possible cost reductions. Finally, consumers' surplus under the different scenarios is also calculated, which allows to give a welfare assessment of the considered merger.
- I.19 The study by Ivaldi and Verboven (2001) is even more targeted to an ex-ante evaluation of how policy practice towards mergers may be improved. They analyze a merger that was assessed and blocked by the European Commission (Volvo/Scania, M.1672) and estimate a full structural model (demand and supply sides) of oligopolistic interactions with differentiated products. They apply this model to the heavy truck market as it was defined by the Commission. They then propose several tests of the intensity of market power. First, they develop a so called "hypothetical market power test", which measures the extent to which hypothetical unilateral price increases by the merging parties would be profitable. Second, they apply an "actual market power test", which measures the actual expected price increases based on more specific assumptions about post-merger firm behaviour. Third, they apply a "comparative market power test": This test follows a dynamic approach and takes into account that the decision to accept or block a merger affects the subsequent

merger process. According to this test, the relevant point of comparison when assessing a merger is not the status quo, but rather a relevant alternative merger scenario that is likely to happen in the event the merger is rejected.

- I.20 Pinske and Slade (2004) examine sequential mergers in the UK brewery industry. They assess the effects of a successful merger and simulate the impact of a proposed one based on a structural model of demand, cost, and market equilibrium. After estimating with parametric and semi-parametric techniques the demand for brands of a differentiated product, they use the estimated parameters, together with engineering data on costs, to predict equilibrium prices and margins. They test their equilibrium assumption and find that the static price Nash equilibrium cannot be rejected. Finally, based on this equilibrium concept, they simulate three possible scenarios: “before” (before the successful merger occurred), the “status quo” (with the successful merger but without the proposed one), and “after” (if the proposed merger was carried out).
- I.21 Finally, Slade (2004) contributes to the understanding of the nature of the market power effect and proves that it is possible to econometrically disentangle the unilateral and coordinated effects of a merger (see also Nevo, 2001). Different modelling and techniques are used to simulate the consequences of a merger in UK brewery. Robust support for this merger to raise market power is found and it is shown that this increase is determined by the firms’ post-merger unilateral incentives to increase prices rather than from the enhanced possibility of collusive agreements.
- I.22 Although so far structural models have been used to make ex-ante predictions on the likely impact of the merger at the time of its assessment, they can also be used to evaluate ex-post the impact of the merger on the relevant market (Pinske and Slade, 2004), in the light of the actual development of the market and the decision of the antitrust authority.

## **I.5 Case studies**

- I.23 A different approach to the ex-post analysis of mergers consists in studying the impact on competitions of deals that were opposed by the antitrust authority, but were consummated anyway. Schumann et al. (1997) examine the Weyerhaeuser's acquisition of Menasha Corporation's west-coast corrugating medium and corrugated box operations. The FTC challenged the merger based on anticompetitive concerns arising from

concentration in the corrugating medium market. It did not give any weight to the potential for efficiencies in corrugated box production due to Weyerhaeuser's increased vertical integration.

- I.24 The authors analyse the pricing behaviour of the merging parties during the "hold-separate" period in which the court attempted to maintain the acquired corrugating-medium mill as an "independent" entity. They find that the unfettered acquisition would have likely led to lower prices, and the hold-separate order may have created agency problems that permitted anticompetitive behaviour and prevented efficiencies.
- I.25 Morrison (1996) studies the effects of three mergers that took place in the US airline industry in the middle of the '80s. The first two mergers, between Northwest Airlines (NW) and Republic Airlines (RC), the first one, and between Trans World Airlines (TW) and Ozark Air Lines (OZ), the second, were opposed by the Antitrust Division of the DoJ, but were allowed by the US Department of Transportation, which had jurisdiction at the time. The third merger was between USAir (US) and Piedmont Aviation (PA) and was not opposed by the competition authorities. In all three mergers, the merging parties shared several routes in common. In the opposed mergers the parties also shared their hubs.
- I.26 The analysis reveals fare increases of 2.5% for the NW-RC merger and fare decreases for the TW-OZ merger of 15.3%. These two mergers performed much better than the US-PA merger which caused long-run fare increases averaging nearly 23%.
- I.27 A recent ex-post evaluation of merger decisions has been carried out by PricewaterhouseCooper (2005) for the UK Department of Industry and the UK Office of Fair Trading. The study examines 10 of the 29 cases that were cleared without remedy by the Competition Commission over the 120 mergers that were referred to the Competition Commission between 1991 and 2002. The research does not consider any prohibition decision or any decision in which some remedies were imposed. Hence, it addresses only the possibility of type II errors (unconditional approval of anticompetitive mergers).
- I.28 The authors of the study conducted a series of in-depth interviews with different market participants (such as buyers, competitors, the merged parties, new entrants and other relevant third parties). The aim of these interviews was to establish what had happened to the market both

immediately after the merger and in the longer-run in terms of prices (and quality), market structure (including new entry), and changes in buyers' behaviour, technology and market definition.

- I.29 This qualitative analysis aimed at understanding whether the market had remained competitive after the merger, and, if so, what had been the most important short- and long-run competitive constraints. The authors conclude that in 5 of the 10 cases the analysis of the Competition Commission of the impact of the merger on competition and their identification of competitive constraints has been confirmed by subsequent events. In two other cases, although the decision of the Competition Commission was to be considered appropriate, this stemmed from competitive constraints that were different from those envisaged by the Competition Commission. In one case the decision was too recent to allow any firm conclusion. Only in two cases the authors find significant differences between the Competition Commission's analysis and the post-merger outcome. However, also in these cases, according to the authors of the study, after some initial loss of competition immediately following the mergers, effective competition was restored thanks to some new entry.

## **I.6 Tests of the assessment methods**

- I.30 Another recent work by Peters (2003) assesses the reliability of simulation models to predict the consequences of mergers. His paper uses merger simulations to predict post-merger prices for six major airline mergers that occurred in the 1980's, and compares these predictions with actual post-merger prices. He finds that post-merger price increases in overlap markets were significant. The merger simulation models try to predict the effect of a change in ownership on this price increases. The results of the analysis show that the transfer of ownership accounts for a large component of the post-merger price change. However, changes in marginal cost also played a very important role. This suggest the need to incorporate a careful analysis of the effects of a merger on costs.
- I.31 Peters also points out that the results of the merger simulation are heavily dependent on the model used and especially on the demand function employed in the model. He argues that the logit or nested nested logit models should be used with caution. Finally, he finds that linear predictions based on the empirical relationship between price and market structure can yield results which are reasonably close to the predictions from formal simulation.



## **I.7 Determinants of the merger decisions**

- I.32 A different strand of the literature investigates the determinants of the merger decisions adopted by the competition authorities. An early contribution on this topic is that of Coate, Higgins, and McChesney (1990). They use a probit model to analyze 70 merger cases decided by the US FTC, between June 1982 and the end of 1986. The FTC decisions were explained by variables on the HHI, barriers to entry, and ease of collusion as interpreted by the FTC's legal and economics staff, and a selection of political variables. Coate et al. find that the market related variables explain most of the outcomes of the regulatory process, whereas the political pressure from the US Congress influences the merger decisions only at the margin. Hence, they support a public interest model of antitrust. Follow-on studies further developed these initial conclusions, using new data as it became available (see, Coate and McChesney (1992), Coate (1995), and Coate (2002)).
- I.33 Other studies on the determinants of the merger decisions have been carried out by Khemani and Shapiro (1993) for mergers in Canada: by Weir (1992, 1993) for mergers in the United Kingdom (UK): and by Davies, Driffield, and Clarke (1999) for non-merger UK enforcement. These studies largely support a public interest model of antitrust enforcement as they suggest that merger decisions are mainly driven by market variables such as the degree of concentration, the size of the merging firms' market shares and the level of entry barriers. The only result supporting a Public Choice model is in Weir (1993) who notes that the Monopolies and Merger Commission (MMC) was less likely to allow hostile mergers whereas post-merger market share did not appear to affect the authority's decision
- I.34 Bergman, Jakobsson, and Razo (2005) analyse merger decisions made by the European Commission, using a sample of 96 mergers from the period 1990-2002. The authors find no indication that political aspects influence the Commission decisions. In particular, their results show that the nationality of the merging firms has no effect on the probability of a merger being subjected to a phase 2 analysis or being prohibited, and that the change of commissioners that occurred in mid-1999 did not impact on the enforcement of the merger regulation. Bergman et al. find the decision are mostly influenced by variables that the economic theory suggests as relevant for the welfare effects of a merger. In particular, market share and barriers to entry are positively related to merger prohibitions. However, the authors conclude that their findings cannot be interpreted as suggesting

that the Commission has made the right decisions in the past, and argue that this issue can be addressed only through a case-by-case analysis.

I.35 Some results in Bergman et. al (2005) are challenged by a research by Aktas, Bodt and Roll (2004) who use a a probit model to analyze the determinants of the probability of regulatory intervention. They collected data for a sample of 290 mergers in which it was possible to identify a listed acquirer or target and the existence of some listed European competitors. The authors then consider that the merger affect negatively the European competitors if their stock price exhibits negative abnormal returns at the date of the merger announcement. They find that the joint effect of bidder nationality and European competitors abnormal returns is significant. For mergers initiated by foreign bidders, the more negative the returns of European competitors around the initial merger announcement date, the higher is the probability of regulatory intervention. Therefore, they conclude that the European Commission follows a protectionist stance.

I.36 Some studies have performed a comparative analysis of the merger regimes in the EU and the US,. Lévêque (2005) investigates whether EU and US competition authorities are more or less interventionist using descriptive statistics about 75 cases that were decided on both sides of the Atlantic. The author finds that in 51 of the 75 cases, the FTC or the antitrust division of the US Department of Justice (DOJ) and the European Commission made the same decision. He also observed the FTC or DOJ unconditionally accepted four deals that were allowed by the EU only after commitments. In contrast, the European Commission unconditionally approved 18 cases that were allowed by the FTC or DOJ only after commitments. Contrary to a widespread impression, Lévêque concludes that the results of the research appear to indicate that the US authorities are more interventionist. However strong conclusions are unwarranted as different geographical markets may face different competitive conditions and may explain the different attitude of the competition authorities.

## **I.8 Conclusions**

I.37 In our opinion, the main indications of this literature are: 1) the lack of a unique methodology that fits all possible antitrust and merger cases; 2) the existence of specific problems with respect to mergers; 3) the requirement, especially for mergers, to adopt a case by case approach that fully accommodates the specificities of the markets and of the transaction.

## **Appendix II - The empirical techniques**

- II.1 The ex-post evaluation of a Commission's merger decision can be carried out by means of several empirical and econometric techniques:
- structural models and simulations;
  - evaluation methods;
  - event studies; and
  - surveys.
- II.2 These methods are not mutually exclusive and the best approach would be to use more than one simultaneously, in order to minimize the probability of errors in the evaluation. However, there are cases when some of them cannot be used due to the lack of appropriate data or to the nature of the market(s) under exam. For example, evaluation methods can only be used to reliably estimate the effects of a set of mergers, and not of a single one, because a cross section of observations is necessary and the event study methodology requires the firms to be quoted on the stock market.
- II.3 In this Appendix we will discuss for each of these techniques: the types of decision for which they are appropriate, the counterfactuals they can evaluate, their data requirement and mode of use, how easy it is to interpret their result and their strength and weaknesses. These detailed information should help in the choice of the appropriate methodology that can be used in assessing a specific decision.

### **II.1 Structural models and simulations**

- II.4 This methodology has been developed in the last two decades following the "New Empirical Industrial Organization" paradigm (see Reiss and Wolak, 2005 for an excellent presentation). It tries to link economic theory and statistical analysis. The central idea is to empirically estimate structural equations that are derived from game theoretic models of oligopolistic interactions and then use the estimated parameters, that constitute the primitives of the model, to simulate possible future scenarios (see Berry, 1994; Berry et al. 1995; Hausman, Leonard, and Zona, 1994; Hausman and Leonard, 1997; Werden and Froeb, 1994; Werden, 1997; Nevo, 2001; Goldberg and Verboven 2001, Pinske, Slade, and Brett, 2002).

- II.5 Traditionally, the estimation of the demand side has attracted most of the interest in the literature. This is because firms' pricing behaviour strongly depends on demand elasticities, in particular on residual demand elasticities. In fact, it can be easily showed that price cost margins for a firm are equal to the inverse of the residual demand elasticity, i.e. the prices are very close to marginal cost if the demand reacts very elastically to price changes. Thus, elasticity and cross elasticities play a central role in determining how substitutable products are among each other and hence how intensive is competition among differentiated products.
- II.6 As Pinske and Slade (2004) point out: "For the purpose of merger evaluation, the ideal demand model would possess the following characteristics: it would be (i) flexible in the sense that it would impose no restrictions on the estimated own and cross-price elasticities, (ii) simple, transparent, and easy to estimate using standard computer software, and (iii) capable of handling a large number of brands or products. Unfortunately, no model is ideal, and one must consider tradeoffs among the strengths and weaknesses of each, taking into consideration the features of the market and the data."
- II.7 The supply side is estimated from the first order condition of the firms' profit maximization problem. It also requires that some assumptions are made on the cost structure and on the equilibrium concept. However, flexible modelling forms might allow considering several games in one single model (see Nevo, 2001 and Slade, 2005).
- II.8 The demand side and the supply side can be estimated simultaneous or in steps, usually starting from the former. Their simultaneous estimation , although more cumbersome, can help in enhancing the precision of the estimation of both the demand function and the marginal cost (see Jaumandreu and Moral, 2006).
- II.9 The typical way these models are used, once estimated, is to calculate the post-merger equilibrium using the pre-merger data. This allows to predict the merger's effects under different assumptions. Hence, it is possible to play with the cost parameters, assuming that the merger exploits some synergies between the merging firms, and to determine what cost savings are needed in order to have a welfare enhancing merger. In addition, one can also simulate different equilibria, if one expects that the merger will change the way firms interact (for instance because tacit collusion

becomes much more likely after the merger). Jaumandreu and Moral (2006) provide a more flexible modelling approach, which allows to estimate and test changes in the firms' behaviour following a policy intervention.

- II.10 The same kind of methodology can potentially be used to generate and analyse the effects of alternative decisions (i.e. counterfactuals). A relevant example is the work by Ivaldi and Verboven (2005) that simulates the possible effects of a proposed merger, but considers other scenarios which could be triggered by this merger as other counterfactuals.
- II.11 This methodology can be extended to ex-post evaluations of mergers. The same model, used ex-ante to simulate the effects of the merger, can be estimated ex-post with the post-merger data to evaluate the merger effect directly, avoiding appealing to simulation techniques (see for instance Pinske and Slade, 2004). The comparison between the simulated outcome obtained with ex-ante data and the outcome obtained by estimating the model with ex-post data, under the same equilibrium assumption, allows evaluating whether the predictions on which the decision was based were correct. Beside, this kind of exercise constitutes a good robustness check that guarantees credibility to the simulation of other scenarios.
- II.12 The use of ex-post data together with a flexible form for the cost function, might also allow to assess the extent of efficiency gains (Ivaldi and McCullough, 2005)<sup>2</sup>. This is a fundamental point since the existence of efficiencies is the sole reason for a merger to be welfare enhancing.
- II.13 Of course, the ex-post data used for the estimation depend on two things: i) the effect of the merger being carried out (or not) and ii) the effect of the Commission's decision. Therefore, what we observe ex-post is the merger effect net of the decision's one. Simulation techniques can, however, be used to disentangle the two. The estimated parameters can then be used to simulate the welfare effects of several counterfactual decisions.

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<sup>2</sup> It consists in estimating several factor demand equations for the factor prices, derived by applying the Sheppard's lemma, which contains all the parameters of the cost function. In this way, it is possible to estimate a cost function that enables to assess efficiency gains.

### **Type of decision for which they are appropriate**

- II.14 This methodology is based on a strong connection between theory and empirics, because much structure on the model is to be imposed from the theoretical side (i.e. the demand form, the cost structure, the equilibrium concept and the stochastic structure). Hence, one must be careful when applying the model to the data that these theoretical assumptions really fit the analyzed market(s).
- II.15 For example structural approaches based on models of oligopolistic competition with differentiated goods are, in general appropriate for consumer goods' markets such as cars (Berry et al. 1994, Goldberg and Verboven, 2001), banking services (Jaumandreu and Lorences, 2002), soft carbonated drinks (Mariuzzo et al. 2005), ready to eat cereals (Nevo, 2001), and beer (Slade, 2004). However, markets characterized by strong buyer power are much better explained by models of bilateral oligopoly (see Bonet and Dubois, 2006 for an example of structural model in such a setting).
- II.16 These traditional models of oligopolistic competition are also not well suited to represent bidding markets. However, the empirical literature in the field of auctions has progressed enormously, providing new instruments that can be used in this context (see for instance Athey and Heile, 2005).

### **Counterfactuals**

- II.17 One advantage of the structural approach is that it allows to build several counterfactuals. Once the structural model is estimated, it is possible to use the estimated parameters to simulate different decisions. This allows to test how well the predictions based on the ex-ante estimates match the actual outcome of the post-merger market.
- II.18 However, while it allows to consider the simplest counterfactual (i.e. the situation in which the merger is blocked or in which the merger is unconditionally cleared) and also structural remedies, such as divestitures, , it seems almost impossible to explicitly consider behavioural remedies – such as licensing, access, or breaching of contracts. The reason is that incorporating the subtleties of the behavioural conditions would render the model extremely complex and, probably, intractable. To the best of our knowledge, the economic literature so far has not addressed this problem.

## Data requirements

- II.19 This approach requires a quite large amount of data. Clearly the amount of data needed depends on the complexity of the adopted approach, but equally the availability and quality of the data determines which model can be used.
- II.20 Generally, cross-sections of price and quantity data, as well as demand<sup>3</sup> and cost exogenous shifters<sup>4</sup> are needed. Panels of data, which entails both a cross-sectional and a time variation, are even better because they allow a more careful treatment of the industry and country-specific fixed effects and of time trends. This strongly increases the reliability of the estimation and, hence, of the simulation results.
- II.21 In addition the data have to be of high quality and reliable. Hence, measurement issues should be carefully assessed and addressed, otherwise the estimates would be inconsistent or biased. A key problem is that the observed data does not come from a controlled experiment which implies that one all kinds of statistical problems can arise: selection, aggregation, censoring and mis-measurement.
- II.22 The level of aggregation of the data is also important. In recent years and for some specific markets, better data is available, for example the so called “scanner data” (i.e. data on transactions in single shops) and/or consumer surveys. This kind of data has the advantage of a very low degree of aggregation. Most often, unfortunately, data are aggregated at the market level. This does not make the estimation of structural models impossible, it imposes the use of further assumptions (see for instance Deaton and Muellbauer, 1980).
- II.23 To limit the data problems that an ex-post analysis can incur in, it would be advisable to ask the firms involved in a merger decision to make data available also once the antitrust inquiry has been completed, as good quality data can mostly be provided only by the parties involved in the merger, especially when it comes to data on costs.

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<sup>3</sup> Depending on the modelling assumption adopted for the demand side, the demand shifters needed can be the characteristics of the product or of the customers, or more general and aggregated indicators of the consumers' willingness to pay (such as income per capita or regional demand characteristics).

<sup>4</sup> The existence of explicit cost information can be very helpful in testing the quality of the adopted model/specification and can allow to test the equilibrium assumption.

## **Mode of use**

- II.24 Setting up a structural model requires several steps. First of all it is necessary to specify an appropriate economic model and to define the stochastic process that generated the observed data, then it is necessary to estimate the model and to test it. Finally, using the results from the estimation of the model, one has to use simulation techniques to predict the outcomes of interest.

## ***The economic model***

- II.25 The first step consists in specifying the economic model that represents how firms interact in the market under exam. This entails specifying:
- a. the functional form of the demand curve;
  - b. the firms' cost structure
  - c. the firms' behaviour (i.e. the equilibrium concept).
- II.26 The functional form of the demand curve depends on the nature of the goods or services exchanged in the market (i.e. whether these are homogeneous (see Genesove and Mullin, 1999) or differentiated). The most used approach when the goods are differentiated is based on a general class of discrete choice models of consumers' behaviour (see Mc Fadden 1974), where utility is modelled as a function of consumers' tastes and products' characteristics, and the demand for each product is derived from the aggregation of the consumers' individual choices. Alternatively, it is possible to apply a multi-budgeting approach together with an almost ideal demand system model to construct a multi-level demand system for differentiated products. This methodology divides products into small groups and within each group allows a flexible functional form for the consumers' utility (see Hausman, Leonard and Zona, 1994). Another option is the distance-metric demand model (see Pinske, Slade, and Brett, 2002), which allows to experiment with and determine the strength of competition along many dimensions. This approach is based on a normalized-quadratic, indirect utility function, which leads to linear market-level demand equations in normalized prices and income and depends on the "distance" between the products along several dimensions in the characteristic space.
- II.27 Most recently the literature has concentrated on the discrete choice models and several robust and accepted approaches to model demand have emerged. The simplest one is the logit model (simplest discrete



choice model to solve but with most stringent limitations). It assumes that the utility function of each consumer is a function of the mean consumer valuation for the particular good, its price, and the product's observable and unobservable characteristics. The logit model delivers very simple linear demand functions, but it imposes very unrealistic substitutions patterns among goods, such as the so-called "independence of irrelevant alternatives property" which states that the distribution of a consumer's preferences over products other than the one she bought does not depend on the product she bought. The easiest, and mostly used, generalization of the logit model is the nested logit one. This model imposes more structure on the substitution patterns among exhaustive and mutually exclusive groups of goods and allows for substitutability to be higher among goods being part of a same group. In addition this model determines simple demand equations for the different goods, since it allows a closed form solution to the problem of inverting the equations.

- II.28 A more flexible, but also quite cumbersome, model of discrete choice is the random coefficient model proposed by Berry (see Berry 1994) that encompasses several of model of product differentiation used in Industrial Organisation. Unfortunately, this model is quite complicated to solve and needs the use of simulations techniques to express the demand equation.
- II.29 At this point it has to be noted that, depending on the market under consideration, one modelling assumption might be more or less innocuous and that one is faced by the usual trade-off between richness of a model and its empirical tractability.
- II.30 As for the supply side, the economic literature has put less effort in the modelling of the firms' cost structure. Most of the applications assume constant marginal costs. This simplification is caused by the need to simplify the model, as well as the widespread belief that demand elasticities play a central role. As we already mentioned there are very few exceptions (see Ivaldi and Mc Cough, 2005) of papers that tried to integrate the research coming from the estimation of cost functions (another traditional strand of the empirical industrial organisation literature) with oligopolistic pricing models.
- II.31 The last element that needs to be specified in the economic model is how firms interact. The empirical literature has so far mostly focused on three possible "games": Cournot, where firms compete on quantity, Bertrand, i.e.

where firms compete on price, and collusion, where firms jointly maximise profits.

- II.32 While several works have tried to "test" which behaviour seems to be more appropriate in particular circumstances, it has to be noted that the comparisons among different models of competitions is made conditional on the adopted specifications, i.e. conditional on the other "untestable" assumption of the model. Conditional on these other assumptions, is then possible to use statistical test, such as the Vuong test (see Gasmi, Laffont and Vuong, 1992), to question which of the possible behavioural models best fits the data.
- II.33 As we already mentioned, the fact that a particular pre-merger behaviour is consistent with the data, is not sufficient to believe that the same behaviour will be consistent after the merger. The post-merger data can help to verify if there has been any such change in the firms' behaviour (see Slade, 2004).

#### **The stochastic model**

- II.34 The following step consists in implementing the economic model by adding disturbances, i.e. in defining which stochastic process generated the observed data. One simple and widely adopted method is to simply add a disturbance to theoretically derived deterministic equations and motivate its presence by the existence of measurements errors.
- II.35 A more sophisticated and "structural" way of imposing a stochastic structure on a theoretical model is to use fully-specified stochastic economic models. For instance if the demand curve is modelled by means of a discrete choice theory the stochastic part of the model is structurally derived from the consumers' optimization problem and the error term in each demand equation can be interpreted as the unobserved mean utility of the relevant good.
- II.36 Since the structural model is composed by several equations it is also necessary to develop some assumptions on the joint distribution of the errors terms, such as if there is autocorrelation or heteroschedasticity.

#### **Estimation**

- II.37 Once the model is set up, it has to be populated with the data in order to estimate the parameters of interest for an evaluation of a merger decision.

- II.38 Nowadays, most econometric and statistical software allow using complex estimation methods. However, the choice of the right estimation procedure is delicate and not uncontroversial. The first issue is whether one wants to simultaneously estimate demand and supply or not. If, on the one hand, the joint estimation might increase the precision of the coefficient estimates, on the other hand it may increase the probability of inconsistent estimates, if just one side of the model is not correctly specified. This is one main reason why the demand equations are often estimated separately from the supply ones. Indeed, as already mentioned, most research has concentrated on modelling the demand rather than on the supply side, producing the belief that the demand side of the model might be better specified. Since the estimation of the demand elasticities plays a crucial role also for the determination of the cost-price mark-ups, often demand equations are estimated first.
- II.39 Even if the estimation of the equations is not simultaneous it is still important to take care of any endogeneity problem since prices are quantities that are jointly determined in equilibrium. Hence, the instrumental variables (IV) techniques must be adopted and the right instruments have to be found for the prices. Good instruments have to be highly correlated with the variable to be instrumented, but must be orthogonal to the error term in the demand equations or the coefficient estimates will remain inconsistent. This means that it is necessary to find some variables that move with the prices, but are not correlated with those unobserved factors that cause the demand curve to shift and are captured by the error term. In literature several set of instruments has proposed for prices in the case of demand for differentiated goods. One option is the price for the same products in other markets (see Hausman et al., 1994). These instruments have been used especially with the multi-budgeting approach. With the discrete choice models, under the assumption that products characteristics are exogenous, the observed product characteristics, the sums of the values of the same characteristics of other products offered by the same multi-product firm, and the sums of the values of the same characteristics of products offered by other firms can be used as instruments (see Bresnahan, 1987 and Berry et al. 1995)..
- II.40 If the demand side is estimated first, one can then estimate the supply side using estimates for the demand elasticities coming from the first stage. Also in this case endogeneity issues have to be taken into account.

- II.41 Demand and supply equations can also be estimated simultaneously. In this case the efficiency of the coefficient estimates might increase, but often other exogenous variables are needed to identify the cost parameters.

### **Specification tests**

- II.42 The last step consists in applying robustness and specification tests to the results thus obtained. While the demand parameter estimates should not strongly depend on the cost side and, especially, on the assumptions about the firms' behaviour, the estimated price-cost margins should differ according to the equilibrium assumption (i.e. they should be lower in a more competitive environment), hence it is important to test them.
- II.43 If direct cost data are available, then one could directly test each of the assumed models by comparing the predicted to the observed margins. This is however almost never the case. In absence of this information, there still is the possibility of testing different (non-nested) specifications by means of a Vuong test (see Vuong, 1989 and Rivers and Vuong, 2002)<sup>5</sup> or a Davidson-MacKinnon type of test<sup>6</sup>.

### **Simulations**

- II.44 Once the model has been estimated and tested, several simulations can be made. If, for instance, we consider a multi-product oligopoly model with differentiated goods in which the firms that produce two of the goods

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<sup>5</sup> The logic of the test works as follows:

- derive the equilibrium conditions under different behavioural assumptions; these will be considered as "different models".
- The price cost margins should depend only on demand parameters and cost drivers under some particular functional assumptions on the cost function.
- The demand parameters can be consistently estimated in a first stage, while the pricing equation can be estimated in the second stage.
- Taking any two competing models, the null hypothesis is that the two non nested models are asymptotically equivalent, i.e. when the number of observations on which we base the estimation is large a "lack-of-fit criterion" for the two models tends to converge. The alternative hypothesis is, instead, that one model is better than the other.
- By applying this test to different pairs of models, one might be able to reject some of them and come up with the preferred model.

<sup>6</sup> The intuition behind this test is simple. If the margin estimated from model A has a significant effect on the price-cost margin estimated from model B, it means that model B is unable to represent correctly the data and should be discarded. The test can be also run in the opposite way. The advantage of this test is that it is fairly easy to implement it.

merge, then the equilibrium conditions for both goods is that their prices maximize the sum of the profits generated from the two goods. The first step of the simulation consists, therefore, in calculating the equilibrium given the new market structure and keeping, of course, the pre-merger model as given. One can solve for the post-merger mark-ups of each good, which will depend on the pre-merger mark-ups, as well as on the diversion ratios (i.e. the proportion of sales lost by one product following a rise in its price that is captured by the other product).

- II.45 The second step of the simulation procedure consists in using the estimated parameters and the pre-merger data to predict post-merger equilibrium prices. The new equilibrium prices will depend on the level of the marginal costs and of the own-price and cross-price elasticities of demand (that determine the diversion ratio)<sup>7</sup>.
- II.46 Similarly, the decision of the antitrust authority is to allow two firms to merge conditionally on one firm selling one particular brand to a third firm can be simulated by correctly defining the subset of products over which the joint profit of the new firm is defined. In general, all those remedies that impose a clear change in ownership, such as divestitures, can be simulated.
- II.47 Hence, the procedure allows us to evaluate the level of market power held by the firms and its change by measuring the margins of firms in:
- the initial state of the industry, where market power can be assumed to come entirely from product differentiation;
  - the industry after a notified merger, where the change in market power is a measure of the unilateral effects of mergers.
  - the industry if there is tacit collusion, where the change in market power is a measure of coordinated effects of the merger.
- II.48 While this decomposition of market power in its components can be implemented using existing econometric and quantitative tools, the question of predicting the likelihood of additional mergers or collusion is still unsolved. There exist statistical techniques, like bootstrapping, that

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<sup>7</sup> Both the diversion ratio and the elasticities of demand can be derived from other sources such as market surveys. Surveys are more frequently used when the product the researcher is interested in is bought by other firms rather than consumers, as the lower number of buyers makes the survey less costly to organize.

could offer ways to address this issue, but their use has to be further experimented.

### **Interpretation of results**

- II.49 The structural models approach have the big advantage that their results often are easy to interpret. The use of simulations allows to precisely estimate the effects all the structural parameters of the model, especially consumer surplus and total welfare.

### **Strengths and weaknesses**

- II.50 The main advantage of the structural models lies in its strong game-theoretical foundation, which allows to carefully match the estimated model to characteristics of the relevant market. Different specifications of the demand curve (i.e. homogenous goods and differentiated products), as well as different modes of competition (i.e. Cournot, Bertrand, and collusion) can be achieved. Moreover, structural models can be used to simulate changes in equilibrium outcomes resulting from changes in the underlying market environment. This is possible only because of the strong connection between the parameters of the estimated density function (i.e. the stochastic part of the model) and the underlying economic primitives. If one is unwilling to make assumptions about the underlying economic model, it would be impossible to make sensible predictions about outcomes determined by the change of the environment.
- II.51 Another advantages of structural models is that it allows to examine the sensitivity of the models and of the estimators to alternative economic and statistical assumptions.
- II.52 The major disadvantage of this methodology is the large set of assumptions, both on its theoretical structure and on its stochastic part, one has to make in order to estimate the model. . Hence, it is important to perform serious robustness check, since these models can be quite sensitive to changes in the main assumptions (see for instance Slade, 2004). Very often, however, there are few ways of “testing” these assumptions other than relying on some out-of-the-sample information and data.
- II.53 The functional form choices can also affect the quality of the statistical inferences about the economic primitives (i.e. on the size and power the of hypothesis tests). When, as is usually the case, economic theory does not

suggest functional forms or what variables might be relevant in an application, it will be necessary to make what may seem like arbitrary choices. These choices can have a critical impact on inferences about parameters.

- II.54 Another drawback of the methodology is the high data requirements, especially as one would want to use firm-level data, that allow a much more careful analysis of the market interactions. Furthermore, even though this methodology is quite well developed and most statistical/econometric packages can be used, these models easily become quite complex if one wants to best fit the analyzed markets and their estimation cumbersome.

## II.2 Evaluation methods

- II.55 Evaluation methods, which encompass different estimation methodologies, have been widely used in many other fields of economic research to assess the effects of public policies (see for instance Heckman and Smith, 1999; Besley and Case, 2000; and Vita, 2000). This group of method is based on the idea that by two groups of individuals or firms, the control group and the experimental group, the difference in their performance, other things being equal, provides an estimate of the policy effect.
- II.56 Constructing the counterfactual is the central issue that needs to be address when an evaluation method is used. A major problem - which is surely present when this method is applied it to the analysis of mergers – is that the assignment to the treatment is not random, i.e. the agents self-select themselves to be treated. Hence, because of the possible correlation between the endogenous choice to enrol in the programme and the error term of the outcome, the treatment effect parameter is inconsistently estimated. This correlation comes from the fact that the same unobservable characteristics affecting the decision to merge also affect the performance of the merging firm. Hence, a key part of this methodology deals with the development of instruments able to control for this endogeneity problem.
- II.57 At least four different methods can be used to analyze policy evaluation:
- social experiments,
  - natural experiments,
  - matching methods, and

- instrumental variables.

- II.58 The first method<sup>8</sup> relies on the treatment being completely random and, thus, is seldom useful in economics because the endogeneity of the policy has to be considered. Instead natural experiments and matching methods try to find a “naturally” occurring comparison group that can mimic the properties of the control group. The instrumental variable approach, which is the oldest one among the four, consists of finding variables, i.e. instruments, that explain the policy treatment, but that do not influence the outcome of interest. This method is similar to the structural approach presented earlier, in that it uses economic theory to generate exclusion restrictions that help to identify the parameters of interest.
- II.59 Even though there is not much academic literature on the use of natural experiments in merger control, the idea behind this instrument is extensively used by antitrust authorities for the ex-ante evaluation of decisions, since it (wrongly) appears to be quite simple to use, at least in its most basic form. For instance, once the relevant market has been identified, the authority can, often does, look at what happened in similar geographic or product markets. We will see that this cross-sectional approach can be useful in the analysis of merger decisions.
- II.60 This set of methods has attracted large attention from the literature in the last two decades, introducing a real revolution in the approach to identifying and estimating causal relationships and has become one of the most active field in applied econometrics. Despite the intuitive simplicity of the basic idea, the level of sophistication has strongly increased over time. Starting from the easy to implement dummy variable approach and difference-in-difference estimations that essentially consist of simple OLS regressions, more sophisticated, and computationally challenging, techniques based on sample selection procedures, matching, propensity scores, instrumental variables and semi- and non-parametric approaches have been developed. As for the structural models, there exist a clear trade-off in the use of this methods between ease of applicability and precision and consistency of the estimated results.
- II.61 If properly carried out, these kinds of studies can be a very helpful and flexible instrument, since they rely less heavily on un-testable theoretical assumptions than structural models. However, they have their limits too: 1

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<sup>8</sup> This methodology is widely used in medical analysis because the endogeneity problem is rare and easily addressed.



- 1.....evaluation methods provide more reliable estimates when applied to a set of mergers, than to a single one because in the latter case the data points are too few; hence it is necessary to have data on several mergers, possibly within the same industry;
- 2 evaluation methods rely on un-testable assumptions; and
- 3 evaluation methods place strong requirements on the data; for instance, the most used dummy variable approach delivers consistent estimates of the treatment effect only under very strong assumptions, that are generally not very plausible, and the matching techniques have strong impact on the measurement of the policy effect.

### **Type of decision for which they are appropriate**

- II.62 Potentially, these methods can be applied to any kind of decisions. However, they do not allow disentangling the effect of the merger from the effect of the antitrust decision. The central issue, as mentioned, is the determination of the counterfactual, i.e. the definition of the right control group to avoid any kind of selection bias, which would make the estimation of the desired effects inconsistent.

### **Counterfactuals**

- II.63 The counterfactuals depend on the method chosen. One largely used option consists in comparing the value of the outcome variable of interest in the analyzed market to the same variable in similar markets, that are subject to the same, or similar, demand and supply shocks, but are not affected by the merger decision in question (Vita, 2000; Gilligan, 1992).
- II.64 Cross sectional market analyses are however not always possible because it is not easy to identify “similar” markets. This might be the case, for example, when the relevant geographic market is very large.
- II.65 A second possibility is to use a matching technique and focus on the firm as a unit of observation. Accordingly, the firm’s observable characteristics are used to find a good counterfactual, i.e. a similar firm that was not affected by the treatment/merger.
- II.66 Finally, it has been proposed that time variation rather than cross-sectional variation could be used to measure the policy effect: the merger can be seen as a “natural experiment” that has been created at a particular point in

time and accordingly use standard econometric techniques to assess its effect (see Rubin, 1974; Rosenbaum and Rubin, 1983; Hahn, 1998; Rosenzweig and Wolpin, 2000; and White, 2005). What is needed is to generate a counterfactual on what the outcome of interest in the markets would have been, had the merger not happened, which is derived from the pre-merger period. Since a merger can be viewed as a treatment applied to post-merger observations, the merger effect is then given by the difference between the observed post-merger outcome and the counterfactual one. This approach can prove particularly useful for the ex-post analysis of antitrust decisions when there are actual observations on the market for several years before the merger.

- II.67 One problematic aspect of using this time variation instead of the usual cross-sectional variation is that the exogenous control variables might be measured following the treatment, i.e. they are not really exogenous. Hence, one has to be very careful in controlling that the treatment did not influence the exogenous covariates as well, which would lead to distorted and inconsistent estimates of the natural experiment's impact. For instance, White (2005) in a theoretical paper on the issue develops a framework that allows the effects of such treatments to be analyzed without introducing confounding biases, by using a quasi-non-parametric approach that builds on Hahn (1998), and Hirano, Imbens, and Ridder (2003). This framework is particularly useful both in time-series and cross-section analyses of treatment effects, since it makes strong use of economic theory to identify the observable and unobservable determining factors for the response variable of interest. The method suggest by White has not yet been applied in any empirical study.
- II.68 It has to be noted that this methodology only to consider some of the scenario discussed in Chapter 4. The counterfactual to a merger situation can only be a non-merger situation, or the opposite, provided one can find similar firms that have merged. However, it seems impossible to employ these methods to the evaluation of remedies and conditional decisions.

### **Data requirements**

- II.69 The data requirements depend on the specific method adopted. Anyway some general remarks are possible as one outcome variable (e.g. price or profits) and the exogenous covariates are always needed. For instance, if the dummy variables or the instrumental variable approach is used, all the relevant variables explaining the outcome of interest have to be considered and measured precisely. If this is not done carefully the

coefficient estimates will be biased, because of omitted variables and there will also be measurement bias. Other exogenous variables are needed to identify the selection into the treatment. These variables should be such that they do not affect the outcome of interest.

- II.70 When using matching methods, since they are based on non-parametric estimations, even better quality data is needed, since it has to identify the functional forms. This is less of a problem when one deals with individuals, since precise demographic characteristics are largely available, but in the case of firm good data (such as on their size, market shares, debt structure ) are more difficult to collect.
- II.71 Balance-sheet data can be used to obtain information about the variables of interest or the covariates. This data can be obtained through commercial databases, such Global Vantage, Compustat, Amadeus and Datastream. Alternatively, the raw data can be collected from the internet or by directly contacting the firms. The former sources provide ready to use data, but the databases are relatively costly and have to be rented for long periods of time (generally at least one year). The latter is a very time consuming exercise and the data thus obtained come in a raw form and have to be transformed into a usable format by building some relevant variables. In addition when the geographic market spans across several countries, the issue of comparability of data across country presents some difficulties, which are taken into account in the databases cited above.

### **Mode of use**

- II.72 The typical method employed for estimating the effect of a natural experiment, such as a merger decision, is the so called “difference-in-differences” estimation. It consists in comparing difference in average behaviour before and after the policy change for the treated group, with the difference before and after the event for the comparison group. Under some assumptions it allows to measure the average effect of the treatment on the treated. This is possible because the double differencing helps to remove the individual effects, as well as the common aggregated effects.
- II.73 The two main assumptions have to be satisfied for the “difference-in-differences” estimation method to be applicable: i) the two groups remain the same during the period of the analysis, and ii) that time effects are common to both groups. These assumptions have a strong influence on the choice of the relevant comparison group and have to be checked on a

case by case basis, depending on the problem at hand and on the data availability.

- II.74 As mentioned before, a good methodology for determining a comparison group is based on a matching procedure (Blundell and Costa-Dias, 2000). The idea is to identify sufficient observable characteristics of the analyzed agents such that, conditioning on these, any agent's reaction to any policy decision is the same as the reaction of another agent with the same characteristics, but not subject to the treatment. The matching approach has the flexibility and generality coming from being a non-parametric method: neither has it imposed any parametric assumptions on the functional form of the equation of interest nor distributional assumptions on the structure of the error terms. However, as most non-parametric methods, it requires a lot of high quality data in order to produce meaningful results.
- II.75 Two main assumptions have to be satisfied for this method to be applicable: i) the non-treated outcomes are independent of the participation status, conditional on the set of observables and ii) all treated agents have a counterpart on the non-treated population and anyone constitutes a possible participant.
- II.76 Recently, these methods have been refined by incorporating advances in semi-parametric and quasi-parametric econometrics (Hahn, 1998; Hirano, Imbens, and Ridder, 2003) and the closeness of one agent to another is measured on several individual characteristics, so that a group is defined as such when it minimizes the distance between matched cases<sup>9</sup>.
- II.77 In alternative to the matching technique, one can tackle the endogeneity problem using the standard econometric framework of the IV estimations. In the linear model, the IV estimator solves the endogeneity problem and produces consistent estimates of the treatment effect, if the treatment effect is not heterogeneous across units, i.e. all firms are affected in the same way by the merger. If this is not the case, additional assumptions on the data are required for the treatment effect to be identifiable (see Angrist and Imbens, 1991). As in any other IV framework, it is necessary to find the right instrument(s), i.e. variables that determine the decision to be treated

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<sup>9</sup> One particularly useful instrument that helps to reduce the dimensionality problem is the so called "propensity score method" (Rosenbaum and Rubin, 1983). The idea is to generate one single variable (the propensity score) that captures all of the variance in the covariates relevant for adjusting between-group comparisons and reduces therefore the multidimensionality issue arising by comparing agents along several dimensions.

(merger) but not the outcome equations. Recently, Heckman and Vytlačil (see Heckman and Vytlačil, 1999 and 2005) provided an interesting discussion on the relationship between the treatment effect approach and the structural equations framework.

- II.78 Some other approaches can be applied when longitudinal data are available. A “traditional” dummy variable regression model can be for instance applied to measure the effect of a merger. A dummy is set equal to one for the post merger period and is used as a left hand side variable to explain the variable of interest, controlling for other factors. The dummy’s coefficient consistently estimates the total average ex-post effect of the merger, since it represents the change in the variable of interest when the corresponding merger dummy changes (i.e. going from the “no merger” to the “merger” situation), of course under the assumption that all the other variables remain constant.
- II.79 This traditional approach can deliver useful estimates of merger effects, but only under very stringent conditions. First, one has to control for *all* relevant variables (to avoid the omitted variables bias) and must measure them precisely (to avoid the measurement error bias). Second, the adopted functional forms must be the correct one. Furthermore, the merger’s measured effect is assumed to be time invariant, which of course need not be the case. All in all, the main problem of the traditional approach is that it might be not robust. This feature is particularly problematic when using the model for policy evaluation.
- II.80 Generally, if longitudinal or repeated cross-section data is available, the methods presented above are still applicable and they can provide a more robust estimate of the impact of the treatment. Indeed, the additional time dimension can be used to estimate the treatment effect under less restrictive assumptions, i.e. by using fixed effects estimators one can control for time and individual specific effects (see as examples Hahn, 1998; Heckman and Smith 1999; Hirano et al., 2003; Imbens, 2004). Interestingly, given their flexibility, (propensity score) matching techniques can be combined with difference in difference estimations of the outcome equations. The main matching hypothesis is now stated in terms of the before-after evolution of the covariates instead of levels. It means that the firms in the control group have evolved from the pre to the post-programme period in the same way that the treated firms would have had they not been treated (i.e. the two sets of firms were very similar, but later differ only because of the merger).

- II.81 Once propensity scores have been calculated, they can be used to match merging firms to similar firms that were not subject to the merger and then, by comparing their performance to the treated group, one can consistently estimate the average treatment (i.e. merger) effect (see Bertrand and Zitouna, 2005).
- II.82 This methodology improves the standard dummy regression in that it explicitly allows for imperfect data and misspecifications in the model, therefore, leading to more robust prediction. The two assumptions on which the validity of this method rests are: first, the ceteris paribus clause is met, i.e. everything else is constant between the two groups; second, no other relevant event, part from the merger, must have happened in that market at that particular point in time.

### **Interpretation of results**

- II.83 Evaluation methods, when correctly applied, can be very reliable and informative for a quantitative evaluation of the effects of merger decisions. They directly provide a measure of the average effects of the merger on the variable of interest and therefore, are easy to interpret. However, in order to provide sensible results, these methods should be very carefully applied even more than the structural equations approach presented before.
- II.84 For instance, Lalonde (see Lalonde, 1986) studied the reliability of the non-experimental techniques by comparing the results produced by these methods as commonly applied and the true parameters obtained using experimental data. He found that comparisons from non-experimental samples significantly changes the results and raised the problem of the dependence on the adopted specification for the outcome functional form and participation decision. In general, the necessary conditions to successfully identify the correct parameter must be satisfied by the data. However, this check is difficult to perform (see also Heckman, LaLonde and Smith, 1999) because it requires a comparison with experimental data, which is usually not available.

### *Strengths and weaknesses*

- II.85 The strength of this set of methodologies is their flexibility. The possibility to combine several approaches, such as matching and difference in difference estimation, might help to overcome the limitations of each one

of them. Further, given the advances in the developments of these techniques during the last few years, new estimators and methodology have become available.

- II.86 Another potentially useful characteristic is that there is no strong necessity to define the product market, which can be a problematic issue when using structural methods.
- II.87 However, as already discussed, the appropriate choice of the evaluation method depends on a combination of the data available and the policy parameter of interest. Moreover, some strong assumptions have to be satisfied for these methods to generate consistent and meaningful estimates of the treatment effect, but this is not often the case and it can be hard to check.
- II.88 Finally, high quality data are needed to apply these methodologies, especially the matching approach. The identification of the relevant parameters relies more on a mix between the data quality and the econometrics tools than on the economic theory, as in the structural model approach. This constitutes both a strength and a weakness of this method.

### **II.3 Event studies**

- II.89 The event study methodology has been widely applied since the early 1980s to evaluate the impact of public policy decisions – especially antitrust decisions – on firms’ performance. This approach basically consists in looking at stock markets’ reactions for the involved firms at some relevant events. In the case of a merger the relevant firms are the merging parties and their rivals and the events correspond to the announcement of the merger and the announcement of the Commission’s decision<sup>10</sup>).
- II.90 The method is based on the assumption that if financial markets are efficient and the expectations of the agents operating in them are rational, a firm’s stock price represents the discounted value of this firm’s flow of profits. When an event is announced, which is expected to change the

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<sup>10</sup> Actually a Commission’s decision may be reached in two stages: Phase 1 and Phase 2, but the latter takes place only when the merger raises some concerns and may be prohibited or subjected to remedies. Whether there is going to be a Phase 2 is announced at the end of Phase1. Hence, there can be two events connected to the Commission’s decision: the result of the Phase 1 investigation and the result of the Phase 2 one.

future value of the firm, then “abnormal returns”, i.e. returns that one would not have observed had that particular event not occurred, might be realized. Therefore, one can infer the effects of a merger and of antitrust decisions by looking at abnormal returns for the involved firms around these relevant events.

- II.91 Event studies are not really ex-post evaluations of merger decisions, since the event typically takes place before the merger’s occurrence. However, event studies, at least to some extent, reflect the expected market evolution as perceived by the stock market at the time of the event. More interestingly, however, the event study methodology can be used to evaluate the effect of particular antitrust decisions, not only by measuring abnormal returns around the decision date, but rather by relating the abnormal returns around the merger’s announcement day to the abnormal returns around the decision date (see Duso, Gugler, and Yurtoglu 2006b). Further, the use of long term abnormal returns could help avoiding problems of information leakage during the antitrust investigation and monitor firms performance after the merger, even though they are also plagued by their methodological drawbacks. Finally, and especially for those mergers that are cleared with conditions and obligations, it could be useful to screen the enforcement of the remedies and look at firms’ abnormal returns when some relevant events, like divestitures, are actually implemented rather than decided.

#### **Type of decision for which they are appropriate**

- II.92 Potentially, this methodology can be applied to all decisions given its relative simplicity and the quite low data requirements. There are however some caveats.
- II.93 First of all, the event study methodology can be only applied when the involved firms are quoted in the stock market. Hence, it seems to be mostly applicable to big mergers.
- II.94 Second, the methodology delivers precise estimates of the merger and/or decision’s effects if the markets involved in the antitrust procedure are an important part of the firms’ business. In fact, when this is not the case and the involved firms receive only a small portion of their profits from the relevant markets, then the methodology tends to be biased towards finding no abnormal returns.



- II.95 Third, the method might be difficult to apply when many sub-markets are involved in the merger. It might be possible that the competitive concerns and, thus, the corrective measures imposed by the antitrust authority apply only to some of the involved markets. In this case, it becomes quite difficult to disentangle the effects of these measures since one can at most measure the overall effect on the involved firms. However, one can exploit the fact that the main competitors are different in the various sub-markets in order to make a more precise inference on the effects of the merger as well as of the antitrust decision in each single submarkets.
- II.96 Finally, when a decision is very articulated, for example because it imposes remedies in some markets but not in others, it might be difficult to separate the effects of the different elements of the decision. This problem is very similar to the one discussed above. Again, since the relation between the abnormal returns of the merging firms and competitors is the identifying force of the merger's competitive effect, if the competitors in the different markets are different; one might more clearly capture the effectiveness of the imposed decision. The analysis of the abnormal returns earned by the customers, when these are quoted firms, can also help to address this kind of problem.

### **Counterfactuals**

- II.97 The counterfactual used in event studies is the absence of the merger, when the event is the announcement of a merger, or, the absence of a particular decision, when evaluating the final decisions' effects. The abnormal returns are defined as the difference between the actual stock price of firm around the time of the merger announcement and the stock price one would have observed, had that particular event not taken place.
- II.98 The counterfactual of a firm's stock price is calculated on the basis of financial model, such as the capital asset pricing model<sup>11</sup>.

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<sup>11</sup> The capital asset pricing model (CAPM) is used to determine a theoretically appropriate required rate of return (and thus the price) of an asset. The CAPM formula takes into account the asset's sensitivity to non-diversifiable risk (also known as systematic risk or market risk), as well as the expected return of the market and the expected return of a theoretical risk-free asset. The model was introduced by Jack Treynor, William Sharpe, John Lintner and Jan Mossin independently.

## Data requirements

- II.99 The data requirement for this methodology is quite limited. Once the names of the firms affected by the merger have been identified, one only needs historical data on their stock prices and the value of a related market index for the period of interest. The only constraint is the length of the time required. At least 100 days of prices are necessary to be able to estimate precisely the parameters of the market model, which are used to generate the counterfactual. The standard source for the data is the database Datastream, which is sold by Thomson financial.

## Mode of use

- II.100 Once the necessary data have been collected, an event study is articulated in three phases: calculating the counterfactuals, measuring the abnormal returns (if any) and testing the results.
- II.101 The calculation of the counterfactual for each firm is based on the assumption that a firm's stock price ( $R_{it}$  where  $i$  denotes the firm and  $t$  the day) is proportional to the value of a market index<sup>12</sup> ( $R_{mt}$  where  $m$  denotes the market and  $t$  the day), plus a stochastic error ( $\varepsilon_{i,t}$ ) which consists in unobservable shocks to the deterministic relationship :

$$R_{i,t} = \alpha + \beta R_{m,t} + \varepsilon_{i,t}$$

- II.102 Using the past history of a stock it is possible to estimate the parameters  $\alpha$  and  $\beta$  that rule this relationship. From these parameters it is possible to generate a counterfactual which can be interpreted as the predicted stock value had a specific event not occurred. By contrasting the observed stock value after this event has occurred to the predicted value calculated by means of the market model, it is possible to measure the event-induced value for the involved firms, which is called abnormal return:

$$AR_{i,t} = R_{i,t} - \hat{R}_{i,t} = R_{i,t} - \hat{\alpha} - \hat{\beta} R_{m,t}$$

- II.103 Under the assumption of perfect and complete markets and rational expectations, this quantity perfectly measures the profit the firm is expected to earn because of that specific event.

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<sup>12</sup> Such as the MIB for Italian firms or the Dow Jones for American firms.

- II.104 Since it is possible that some information leaks out before the event happens, the literature has developed the concept of “cumulative abnormal returns”. An event window is defined, which comprises a period of time during which it is expected that relevant information has come to the market. The daily abnormal returns are then summed over this window to give a more accurate and realistic measure of the event profitability effect. These cumulative abnormal returns can be measured both around the merger’s announcement date and the decision dates
- II.105 To underline the robustness of the results obtained through an event study, one could compare them to the estimated (from balance sheet data) profitability effects some years after the merger. For instance, Duso et al. (2006b) made this robustness check by measuring the profitability effects using balance sheet data, partially following the approach proposed in Gugler et al. (2003). They looked at the change in profits for the merging firms and their competitors before and after a merger and contrasted those with the change in profits before and after the same merger for the median firm in the same industry<sup>13</sup>. This difference, which corresponds to the effect of the merger, was compared to the results of the event study.

### **Interpretation of results**

- II.106 First of all, any result should be statistically tested. The next question is how to exploit the information gained by the event studies to evaluate the merger decision. Recently, Duso et al. (2006a) used a simple framework to obtain a measure of whether a merger is pro- or anti-competitive based on static oligopolistic models of market interactions. The approach they follow is based on a prediction of many – but not all – of these models, such as models of Cournot competition with homogenous goods and models of Bertrand competition with differentiated goods. The prediction is that horizontal mergers, ceteris paribus, result in higher product prices in equilibrium. While profit increases for the merging (insider) firms can be due to two effects - and (undesirable) increase in market power but also (desirable) efficiency gains – any increase in the profits of the rivals can only result from a post-merger increase in market power. Hence, the impact of a merger on consumer surplus is directly linked to the impact on the profits of the competitors. In particular, a merger can be classified as pro-competitive whenever the impact of the merger on competitors’

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<sup>13</sup> The industry is defined by the three digit code of the Standard Industrial Classification (SIC).

profitability is negative. Conversely, a merger is presumed to be anti-competitive whenever competitors benefit from it. Event studies can then be used to measure this profitability effects, and positive and statistically significant abnormal returns for the rivals can be seen as a signal of the presence of anticompetitive concerns. In these cases, the antitrust authority should have intervened.

Table II.1 sums up this first step of the analysis.

**Table II.1: How to interpret the effects of mergers on the profits of the merging firms and their rivals**

	<b>Positive profits for merging firms</b>	<b>Negative profits for merging firms</b>
<b>Positive profits for rivals</b>	Market Power Increase; Intervention	Efficiency Reduction; No Intervention <sup>14</sup>
<b>Negative profits for rivals</b>	Efficiency Increase; No Intervention	Efficiency Reduction; No Intervention

Source: *Duso, Gugler, and Yurtoglu (2006a)*

- II.107 A complicating factor concerning efficiency increasing mergers is the possibility that the merger announcement signals some additional information that might reverse the rivals' expected profitability. Eckbo (1983) and Eckbo and Wier (1985) argue that if the production technologies of the competitors are related, then the proposed efficiency increasing merger can also signal opportunities for the rivals to increase their productivity. Under this scenario, the merger announcement is good news from the rival firms' perspective, because it makes them (or the market) aware of profit opportunities that were so far unknown and cannot be used to measure the merger's competitive effect.
- II.108 The second complicating factor concerning the rivals' stock prices is the possibility that the merger announcement signals that a rival is more likely to become a merger target. In this case, the sign pattern of the rivals' abnormal returns would be the same as under the collusion hypothesis. If the proposed merger increases the likelihood that a rival will become an acquirer, then the implied sign pattern would be the same as for the collusion or efficiency hypotheses, depending on whether the market predicted higher or lower profits as a result of the expected acquisition (McGuckin et al. 1992).
- II.109 The second step in the evaluation of merger decision is to relate the stock market reactions around the merger's announcement, which capture the merger competitive effect, to the reactions around the decision's date, -

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<sup>14</sup> As mentioned in Chapter 4, the MCR allows the Commission to approve a merger on the ground that it creates cost and demand efficiencies, but not to block it or impose remedies if it generates inefficiencies. The Commission can only block a merger if there are serious concerns that it may impede effective competition.

which capture the decision's effect, using regression analysis (Duso et al., 2006b). The general idea behind this exercise is that the anti-competitive rents generated by the merger either for merging firms and/or for their rivals around the announcement date should be dissipated by the final decision, if this decision is effective in preserving competition. Therefore, one can regress the abnormal returns around the decision date on the abnormal returns around the announcement date, controlling for other exogenous factors. Accordingly, one should expect a negative coefficient between the effects of the decision and effects of the announcement in case of a valid intervention of the antitrust authority in anticompetitive mergers.

### **Strengths and weaknesses**

- II.110 The main advantage of the event study methodology is that it is simple to apply. Essentially, one needs to collect the stock prices for all the firms involved and calculate the abnormal returns. Moreover, this approach has the advantage of taking care of dynamic aspects, such as entry and exit and changes in the market structure due events other than the merger, which can be much more difficult to account for when using firm-level or accounting data.
- II.111 The main disadvantage of this methodology is that it rests on the fundamental assumption that markets are efficient, i.e. that they can well predict firms' future profitability. Furthermore, the market expectation is based on information available at the time of the event only and, thus, it does not really reflect the additional information provided by the actual post-merger market evolution.
- II.112 Furthermore, even if stock markets are efficient, event studies may fail to detect future changes in profitability if the stock market anticipates the merger. Indeed, if a merger is anticipated, the future changes in profits due to the merger will be incorporated into the firms' stock market value prior to the event. Such anticipations are problematic in the sense that they bias the stock market reaction towards zero. Typically, however, there is some remaining uncertainty about if and when a merger will occur and, therefore, the event carries information. A potentially more severe problem is that the stock market, even though it anticipates a merger, may be uncertain about the identity of the merging firms. As a result, the informational content of the stock market reaction for the merging firms and their competitors may be the allocation of roles among firms rather than expected future changes in profits (Fridolfsson and Stennek, 2004

and 2005). This problem may, at least to some extent, be circumvented by analyzing the stock market reactions not only of the merging firms and their competitors, but also of corporate customers and suppliers. For example a merger's competitive effect may be identified by studying corporate customers' stock market reaction (see Fee and Thomas (2004) and Shahrur (2005) for recent event studies in this spirit). However, the second step of our proposed methodology, i.e. relating decision abnormal returns to announcement abnormal returns, should be less affected by these kinds of problems.

### **II.3 Surveys**

- II.113 The most flexible research tool to conduct the ex post analysis of a merger decision is provided by a survey. A survey involves the collection of data from the relevant subjects or if these are too numerous from a representative sample, through the use of a questionnaire. This technique is a very popular in marketing research, since many different types of information can be collected, including attitudinal, motivational, behavioural and perceptive aspects.
- II.114 If properly designed and implemented, surveys can be an efficient and accurate means for understanding how a market as developed. and for collecting qualitative and quantitative data and. Whenever feasible, a survey should always be carried out to add insights and help the interpretation of the results obtained through other techniques, as well as to obtain data to analyse with these other techniques.
- II.115 Notwithstanding these merits, the use of surveys for the ex-post assessment of merger decisions is not common in the economic literature. The only previous study of this type we are aware of has been carried out by PricewaterhouseCoopers (2005) for the UK Office of Fair Trading, Department of Trade and Industry and the Competition Commission. The authors of the study investigated the market development following ten mergers that were referred to the Competition Commission by the OFT, and subsequently cleared without remedies. For each merger they conducted a series of in-depth interviews with different market participants (such as buyers, competitors, the merged parties, new entrants and other relevant third parties). Through these surveys they sought to was to establish what had happened to the market both immediately after the merger and in the longer-run in terms of prices (and quality), market structure (including new entry), and changes in buyers' behaviour, technology and market definition. They also asked the interviewees what,



in their view, were the most important competitive constraints in the market. The aim was to determine whether there had been any short run loss of competition in the market, and, if so, how the market had responded to this and whether the Competition Commission had correctly evaluated the market conditions.

### **Type of decision for which they are appropriate**

- II.116 Given the flexibility of these tools, surveys can be employed for any type of decision and may be the only available technique to appropriately assess the impact on the market development of a decision that authorised a merger subject to some behavioural remedies or a prohibition (but see the proviso in the next paragraph).

### **Counterfactuals**

- II.117 Also with respect to the counterfactuals, surveys do not face severe limitations as they can be adopted to investigate the likely evolution of the market, had the Commission decision been different, as foreseen or contended by the respondents. It must be said, however, that surveys suffer from response errors or biases that could be extremely severe when respondents are asked to evaluate a totally hypothetical scenario. For this reasons, surveys are probably more suited to assess the actual evolution of the market rather than the its hypothetical evolution.

### **Data requirements**

- II.118 Contrary to the techniques described in the previous sections, surveys are generate data rather than require data themselves. However, some preliminary information is needed to design and administer a survey.
- II.119 The most important information needed refers to the population that has to be surveyed (the so-called target population). In almost all cases, the survey will be primarily directed toward the buyers of the products interested by the merger and that were included in the definition of the relevant market. It may also be useful to collect information from the competitors of the merging firms or from the new entity formed by the merger. In some cases the survey can even cover the suppliers as these may hold cost information. In all cases, it is essential to have a description of the target population in terms of size, geographical distribution and other relevant characteristics.

## **Mode of use**

- II.120 Survey techniques require several steps that need to be carefully planned. They are: 1) design of the questionnaire; 2) sample selection; 3) administration of the questionnaire; and 4) . In what follows we provide some remarks on these steps.

## ***Design of the questionnaire***

- II.121 In designing a questionnaire one needs to balance the desire to obtain a rich set of information with the risk of discouraging the respondents. To get the right balance, it is advisable to start with a clear definition of what one really wants to investigate through this technique. The best way to do so is to write down a list of well defined questions that will form the objective of the research. These questions need not to be those that will form the questionnaire, but will provide a general guidance to write more specific questions that will elicit the information needed to answer the general ones.
- II.122 After defining the objectives, the researcher has to write the questions that will form the questionnaire. These can be formulated in open or closed forms. While closed form questions facilitate the respondents and may lead to a higher rate of completed questionnaires, open form questions may be useful to obtain more general information, or to pick up data that were non anticipated in the design of the questionnaire. Open questions are especially useful in small sample studies in which respondents are particularly qualified and in which the questionnaire is administered by professional interviewers.
- II.123 The questions should be short and clear. The language used should be carefully selected considering the qualifications of those who will respond to the questions (e.g. whether lawyers, technicians, marketing people) so as to avoid misunderstandings. When quantitative data are requested, it can be useful to provide tables (or spreadsheets) that detail the format and the unit of measure<sup>15</sup> in which the answers should be provided.
- II.124 It is advisable to conduct a pilot test of the initial version of the questionnaire. This stage is often squeezed out due to cost and time constraints. However, a pre-test is often extremely valuable as it allows to

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<sup>15</sup> It is important to find out beforehand what is the unit of measure most commonly used in that specific market, to avoid requesting information in a format that is not available or familiar to the respondents

check whether: a) the respondents understand the questions; b) they are able or willing to provide an answer; c) it is advisable to transform some open form questions in closed form questions or vice versa.

### **Sampling**

- II.125 In some cases, the target population is sufficiently small, and the researcher can include the entire population in the study. However for most mergers, , the target population(s) can be too large to attempt to survey all of its members (e.g. if customers are individuals). A small, but carefully chosen, sample should then be used to conduct the survey, which reflects the characteristics of the population from which it is drawn.
- II.126 The methods to form a sample can be classified as either probability or non probability. Probability samples are formed if each member of the population has a non-zero probability of being selected. Some of this methods are random sampling,<sup>16</sup> systematic sampling,<sup>17</sup> and stratified sampling.<sup>18</sup> Non-probability samples are formed by selecting some members of the population in a non random manner. These sampling methods include judgment sampling<sup>19</sup> and quota sampling.<sup>20</sup> The advantage of probability sampling is that the sampling error, i.e. the degree to which a sample might differ from the target population can be calculated. Sampling error. When inferring to the population, results are reported plus or minus the sampling error. In non probability sampling, the degree to which the sample differs from the population remains unknown.

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<sup>16</sup> In random sampling each member of the population has an equal and known chance of being selected.

<sup>17</sup> Systematic sampling requires to select every Nth record from a list of population members. If the list does not contain any hidden order, this is equivalent to a random sampling method.

<sup>18</sup> Stratified sampling consists in defining several strata as subsets of the population whose members share at least one common characteristic. After the identification of the actual representation of each stratum in the population, the researcher uses a random sampling method to select a sufficient number of subjects from each stratum.

<sup>19</sup> Judgment sampling consists in selecting the members of the population to be included in the sample simply on the basis of a rational judgment. For instance, the researcher may decide to include in the sample only those customers that account for a large share of the sales of the merging firms because they represent a sufficiently large share of the demand.

<sup>20</sup> Quota sampling is the non probability equivalent of stratified sampling. The researcher first defines the strata and their proportions, as they are represented in the population, and then uses a judgment sampling method to select subjects from each stratum.

- II.127 Sampling errors arise from estimating a population characteristic by considering only a portion of the population. The incidence of this error depends on the size of the sample and on the variability of the characteristic of interest. If the population is large the size of the sample does not need to be adjusted proportionally to affect the magnitude of the sampling errors. For very small populations the relationship between the size of the sample and the size of the population is more direct.
- II.128 If the sample is formed through a non probability method, the size of the sample is determined by the same judgement method to be employed in deciding the members of the population to be included in the sample. For instance, if the sample is formed by the major buyers in the relevant market, the sample size should be such to cover a significant portion of demand and a significant portion of territories included in the relevant geographic market.

### ***Administration of the questionnaire***

- II.129 There are three basic methods to administer a questionnaire:
- Telephone interview;
  - Self-administered questionnaire; and
  - Face-to-face interview.
- II.130 The choice between them depends largely on the size of the sample and on the type of subjects investigated. For example the questionnaire will be addressed to some large buyers who may be reluctant to provide sensitive information through a telephone interview or the questions may require very detailed quantitative responses that can not be easily provided during an interview.
- II.131 Probably, the best way to administer a questionnaire targeted to companies is to send them a written questionnaire followed by a telephone or face-to-face interview to explain the information provided in writing and pose any additional open question. The distribution of the written questionnaire should be preceded by a letter in which the aims of the study are clearly explained. The letter should also cover all the problems of confidentiality related to the treatment of business secrets and ask to identify the person(s) who will be responsible for collecting the data and respond to the questionnaire. A minute of the follow-up interviews should be agreed with the interviewee. Confidential information should be excluded from the minute.

### **Interpretation of results**

- II.132 Of course the interpretation of the results obtained through the survey will depend on the objectives of the research. In general, surveys directed to sophisticated respondents, such as companies, allow asking direct questions about the issues of interest, so that the interpretation of the responses is straightforward. Follow up interviews can help to clarify the content of the answers.
- II.133 When the data are quantitative the other techniques discussed in this section can be used to analyse them.

### **Strengths and weaknesses**

- II.134 The main advantage of surveys is that they allow investigating some aspects of the development of a market that are difficult to track from hard data. For instance if the market experienced changes on the demand or on the supply side because of new regulations, or of product repositioning these aspects may not be revealed by sales data. Surveys are also useful to get information on the how market players *perceive* the development of the market.
- II.135 However, surveys also have a number of drawbacks, which must be considered in determining the appropriate data collection technique and in interpreting the results. Survey responses are not likely to be as accurate as actual behaviours. The respondent may wish to please the researcher by providing the kind of response that believes the researcher is looking for or impress the researcher by providing the “right” response. This generates a response error or bias.
- II.136 The willingness or ability to reply can also pose a problem. In some cases, the information requested is considered sensitive leading to a high rate of refusal. Careful treatment of the confidentiality issue is necessary to overcome this problem.
- II.137 The interviewer can (inadvertently) influence the response elicited through the phraseology of the questions. In interview surveys, the interviewer can also introduce bias through facial expressions or body language. This is known as interviewer error or bias.
- II.138 Another problem may arise from a low response rate. Depending on the method chosen, the length of the questionnaire, the type and/or motivation

of the respondent, the type of questions can all influence the response rate obtained. Proper questionnaire design and question wording can help increase response rate.

## **II.4 Summary**

- II.139 In this Appendix we have discussed the empirical methods that can be used in the ex-post assessment of a merger decision: structural models, evaluation methods, event studies and surveys. We have provided on how and when to use each of these techniques, as well as some references to the relevant literature for those who wish to find out more.
- II.140 These techniques are useful to help to answer the question whether the actual decision made by the Commission is the best decision it could have made within a predefined set of alternatives (i.e. the question behind the substantive assessment).
- II.141 However, it is likely that the same empirical methods will provide useful insights for the assessment of the analysis behind the decision. Indeed, these empirical methods (or at least some of them) can be employed to investigate both “if” the decision was appropriate/inappropriate and “why”. This is especially true for surveys in which the target subjects could be asked to express their view on the key arguments and could help to identify missing key factors.

## Appendix III - General questionnaire for experts

- III.142 This Appendix contains the template of a questionnaire that can help to identify the key arguments of the analysis that underpins a merger decision. This questionnaire can be used by the reviewer as a support in the identification of the key arguments (see Section 5.3 in Chapter 5) or can be submitted to a panel of experts that could provide their own reading of the decision.
- III.143 If it is sent externally, it is important that the experts are familiar with the MCR and have not been involved in the original decision-making process. For example, the Commission could ask officials of national competition authorities, academics or other independent practitioners to act as experts. It is essential that these experts do not identify what they believe should have been the key arguments used by the Commission in the decision, but what they believe are the key arguments on which the decision hinges (even if they do not agree with the Commission's analysis).
- III.144 Although we have tried to design the questionnaire so that it could be applicable for all type of decisions, we are aware that this template will have to be adapted to each case in order to take into account the number and nature of the markets involved and the type of decision to be assessed. For instance, when evaluating a prohibition decision it is more appropriate to ask whether the "lack" of countervailing factors, rather than their presence, constituted a key argument.
- III.145 Hence, the reviewer may have to adapt the questionnaire to its needs as some of the questions may be redundant or irrelevant and others may be necessary.
- III.146 This questionnaire is meant to help in the identification of the key arguments on which the Commission's decision is based, but often as a result of this exercise it is also possible to identify some key factors that have been overlooked by the Commission (see Section 5.5 in Chapter 5). Hence, this questionnaire ends with an open question that allows those that do not agree with the analysis made by the Commission to highlight which they believe should have been the key arguments.

## ACCOMPANYING LETTER

Dear \_\_\_\_\_,

We are currently conducting an ex-post analysis of the decision made by the European Commission in the case \_\_\_\_\_ (Commission decision of \_\_\_\_\_).

In order to carry out this task we want to assess the validity of the key arguments as put forward by the Commission in its actual decisions. A preliminary step towards such an evaluation consists in identifying these key arguments.

The following questionnaire is meant to fulfil that purpose.

To help us to perform this task, we kindly ask you to carefully read the final decision made by the Commission in the mentioned case and answer the following questions.

**Please, note that we are not asking to evaluate whether the Commission's decision was correct/appropriate, nor to assess whether each element in the Commission's decision is correct/appropriate. The objective of this questionnaire is only to identify the most important factors that drove the final decision and that need to be investigated in an ex-post analysis.**



## QUESTIONNAIRE

### A. DEFINITION OF THE RELEVANT PRODUCT MARKETS.

**A.1.** For each of the relevant product market identified in the decision, please identify of the factual assertions and the logical propositions that supported the Commission's view that two or more products are substitute/not substitutes.

**A.1.a** Factors related to the intended use of the products

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**A.1.b** Factors related to some characteristics of the products

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**A.1.c** Factors related to the cost/price use of the products

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**A.1.d** Other factors

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**B. DEFINITION OF THE RELEVANT GEOGRAFIC MARKETS.**

**B.1** For each of the relevant geographic markets as identified in the decision please identify of the factual assertions and the logical propositions that supported the Commission's view that two or more areas belong/do not belong to the same market.

**B.1.a** Factors related to the existence of legal and other similar barriers

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**B.1.b** Factors related to transportation costs

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**B.1.c** Factors related to the specificity of local demand

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**B.1.d** Other factors

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**C. MODE OF COMPETITION.**

For each of the relevant markets as identified in the decision answer the following questions.

**C.1.** How would you define the mode of competition as identified by the Commission?  
(note: you do not have to provide your opinion on what is the mode of competition in the relevant market, but your reading of the Commission's position)

Cournot (homogeneous products)	Bertrand (differentiated products)	Bidding market (less frequent large single-unit auctions)	Procurement market (frequent, medium-small or multiunit auctions)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**C.2** How would you rank the role of the mode of competition as identified by the Commission for the actual decision made by the Commission?

key	very important	important	of secondary importance	immaterial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**D. UNILATERAL EFFECTS.**

For each of the relevant markets as identified in the decision answer the following questions.

**D.1.** How important for the Commission's actual decision were concerns that the merger would give rise to unilateral anticompetitive effects?

key	very important	important	of secondary importance	immaterial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**D.2.** The Commission may raise concerns about unilateral anticompetitive effects if the merging firms have large market shares. How important was this factor for the Commission's actual decision?

key	very important	important	of secondary importance	immaterial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**D.3.a.** The Commission may raise concerns about unilateral anticompetitive effects if the merging firms' products are particularly close substitutes. How important was this factor for the Commission's actual decision?

key	very important	important	of secondary importance	immaterial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**D.3.b.** What are the main factual assertions that supported the Commission's view that the products of the merging firms are or are not close substitute?

Factual assertions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

Logical propositions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**D.4.a.** The Commission may raise concerns about unilateral anticompetitive effects if consumers have limited possibilities to switch suppliers. How important was this factor for the Commission's actual decision?

key	very important	important	of secondary importance	immaterial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**D.4.b.** What are the main factual assertions and logical propositions that supported the Commission's view that the consumers have limited possibilities to switch suppliers?

Factual assertions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

Logical propositions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**D.5.a.** The Commission may raise concerns about unilateral anticompetitive effects if competitors to the merging parties are capacity constrained and as a result are unlikely to increase supply in response to price increases or output restrictions by the merging firms. How important was this factor for the Commission's actual decision?

key	very important	important	of secondary importance	immaterial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**D.5.b.** What are the main factual assertions and logical propositions that supported the Commission's view that the consumers have limited possibilities to switch suppliers?

Factual assertions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

Logical propositions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**D.6.** The Commission may raise concerns about unilateral anticompetitive effects if the merger enables the merging firms, for example through an increased control over inputs or patents, to foreclose rival firms. How important was this factor for the Commission's actual decision?

key	very important	important	of secondary importance	immaterial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**D.7.a.** The Commission may raise concerns about unilateral anticompetitive effects if one of the merging parties is a potential entrant. Thereby the merger would eliminate an important future competitive force. How important was this factor for the Commission's actual decision?

key	very important	important	of secondary importance	immaterial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**D.7.b.** What are the main factual assertions and logical propositions that supported the Commission's view that one of the merging parties was a potential entrant?

Factual assertions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

Logical propositions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**E. COORDINATED EFFECTS.**

For each of the relevant markets as identified in the decision answer the following questions.

**E.1.** How important for the Commission's actual decision were concerns that the merger would give rise to coordinated anticompetitive effects?

key	very important	important	of secondary importance	immaterial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**E.2.a.** The Commission is more likely to raise concerns about coordinated anti-competitive effects in markets where it is relatively easy to reach an agreement on the terms of the coordination. Reaching such an agreement may be easier in markets with homogenous goods or where consumers have relatively simple characteristics (for example it may be relatively easy to segment markets where consumers can be divided according to their location). Similarly it may be easier to reach an agreement if firms are similar in terms of market shares or cost structures. How important were these factors for the Commission's actual decision?

key	very important	important	of secondary	immaterial
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			importance	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**E.2.b.** What are the main factual assertions and logical propositions that supported the Commission's view about the product homogeneity and firms symmetry?

Factual assertions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

Logical propositions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**E.3.a.** The Commission is more likely to raise concerns about coordinated anticompetitive effects in markets where it is relatively easy to monitor the coordination. Coordination is easier to monitor in relatively transparent markets such as markets where transactions take place on a public exchange. Conversely coordination is more difficult to monitor in markets where transactions are confidentially negotiated between buyers and sellers or when the economic environment is unstable. How important were these factors for the Commission's actual decision?

key	very important	important	of secondary importance	immaterial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**E.3.b.** What are the main factual assertions and logical propositions that supported the Commission's view about the transparency and the stability of the market?

Factual assertions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

Logical propositions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**E.4.a.** The Commission is more likely to raise concerns about coordinated anticompetitive effects in markets where the consequences of deviating from the agreement both are credible and sufficiently severe. The credibility of the deterrence mechanism depends on whether the coordinating firms have an incentive to retaliate against a deviating firm (i.e. the short run losses from retaliation should be smaller than the long run gains). How important were these factors for the Commission's actual decision?

key	very important	important	of secondary importance	immaterial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**E.4.b.** What are the main factual assertions and logical propositions that supported the Commission's view about the possibility of retaliations against deviations?

Factual assertions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

Logical propositions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**E.5.a** The Commission is more likely to raise concerns about coordinated anticompetitive effects if one of the merging parties is a maverick firm with a tradition of disrupting coordination by undercutting high prices. How important was this factor for the Commission's actual decision?

key	very important	important	of secondary importance	immaterial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**E.5.b.** What are the main factual assertions and logical propositions that supported the Commission's view about the role of maverick firm of one of the merging parties?

Factual assertions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

Logical propositions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**E.6.a** The Commission is less likely to raise concerns about coordinated effects if non-coordinating firms can jeopardize the outcome of the coordination, for example by increasing their supply or reducing their prices. How important was this factor for the Commission's actual decision?

key	very important	important	of secondary importance	immaterial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**E.6.b.** What are the main factual assertions and logical propositions that supported the Commission's view about the ability/inability of outside firms to jeopardize the outcome of the coordination?

Factual assertions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

Logical propositions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**F. COUNTERVAILING FACTORS**

For each of the relevant markets as identified in the decision answer the following questions.

**F.1.** The Commission may disregard initial anticompetitive concerns if it finds that countervailing factors are likely to counteract the competitive concerns. How important were countervailing factors for the Commission’s actual decision?

key	very important	important	of secondary importance	immaterial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**F.2.a.** The Commission may disregard initial anticompetitive concerns if the merging firms’ customers have significant buyer power. Buyer power may take various forms. For example, customers may have the ability to change supplier, they may threaten to vertically integrate upstream, they may sponsor upstream entry or they may refuse to buy other products produced by the merging firms. In the context of coordinated effects, a large buyer may render coordination more difficult by tempting the suppliers to deviate from the terms of coordination, for example by offering suppliers long term contracts. How would you rank the role of buyer power as a countervailing factor for the Commission’s actual decision?

key	very important	important	of secondary importance	immaterial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**F.2.b.** What are the main factual assertions and logical propositions that supported the Commission’s view about the existence of buyer power?

Factual assertions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

Logical propositions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**F.3.a.** The Commission may disregard initial anticompetitive concerns if it judges entry to be likely, timely and sufficient in order to counteract the competitive concerns. The Commission is more likely to take entry into account if barriers to entry are low, if the market is expected to grow or if suppliers in other markets already possess production facilities that could be used to enter the market in question. How would you rank the role of future entry as a countervailing factor for the Commission's actual decision?

key	very important	important	of secondary importance	immaterial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**F.3.b.** What are the main factual assertions and logical propositions that supported the Commission's view likelihood, timeliness and sufficiency of entry?

Factual assertions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

Logical propositions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**F.4.a.** The Commission may disregard initial anticompetitive concerns if it judges that the merger is likely to generate large efficiencies. For efficiencies to be taken into account, they must benefit the consumers, be merger specific and be verifiable. Consumers are more likely to benefit from efficiencies if they take the form of variable rather than fixed cost savings. In the context of coordinated effects, efficiencies may benefit consumers by providing the merged entity with incentives to disrupt the coordination. How would you rank the role of efficiencies as a countervailing factor for the Commission's actual decision?

key	very important	important	of secondary importance	immaterial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**F.4.b.** What are the main factual assertions and logical propositions that supported the Commission's view about the role of efficiencies?

Factual assertions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

Logical propositions

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**F.5.a.** The Commission may disregard initial anticompetitive concerns if one of the merging parties is failing. The Commission takes into account that one of the merging parties is failing only if the failing firm's assets, in the absence of the merger, would exit the market anyway and provided that there are no less anti-competitive concerns than the notified merger. How would you rank the role of one firm being failing as a countervailing factor for the Commission's actual decision?

key	very important	important	of secondary importance	immaterial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**F.5.b.** What are the main factual assertions and logical propositions that supported the Commission's view about one firm being failing?

Factual assertions

- 1) \_\_\_\_\_
- 2) \_\_\_\_\_
- 3) \_\_\_\_\_

Logical propositions

- 1) \_\_\_\_\_
- 2) \_\_\_\_\_
- 3) \_\_\_\_\_

**G. OPEN QUESTIONS**

For each of the relevant markets as identified in the decision answer the following questions.



**G.1.** The previous questions are unlikely to cover all possible factors that may have been influential in actual merger decisions. Which other factors did you find to be important for the Commission's actual decision and how would you rank them according to the previous scale (i.e. key, very important, important and of secondary importance)?

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**G.2.** Considering all factors mentioned in this questionnaire, including those provided by you in answering the previous question, rank all important factors (from key to of secondary importance) from the most to the least important

MOST IMPORTANT

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LEAST IMPORTANT

**G.3.** Please, give a brief summary of the key arguments made by the Commission

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**G.4.** You may not agree with the analysis developed by the Commission because you believe that it overlooked some key factors. If this is the case please list the key factors that you consider the Commission to have missed.

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**G.5.** For each of the factors listed above, please why do you believe it to be key in the assessment of the effect of the merger.

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

## Appendix IV – Questionnaire for the identification of missing key arguments

- IV. 147 This Appendix contains the template for a questionnaire that can help to identify any key factor that may be missing in the analysis that underpins a merger decision (see Section 5.5 in Chapter 5).
- IV. 148 Since the presence on missing key factors depends on the content of the decision and on the nature of the key arguments on which the analysis behind the decision hinges, it has been impossible to design a ready-to-use questionnaire. Hence, we have simply prepare a template which shows how the questionnaire should be structured and what kind of questions should be asked. It will then be the reviewer's responsibility to adapt this template to her needs by adding all the questions that it considers relevant. new questions can be added if missing key factors have arisen from the testing of the key logical propositions.
- IV. 149 The specific content of the questions will depend on the arguments identified as key in the decision. Indeed some of the factors considered not be very relevant by the Commission may instead have been very important. In addition, the identification of the missing key factors can also be a by-product of the assessment of the validity of the key arguments, which it may be worthwhile to verify with the market players.
- IV. 150 Further, as in the template, the questionnaire should always include some open questions that allow the market players to highlight any market characteristics that may have been overlooked by the Commission and not identified by the reviewers.
- IV. 151 This questionnaire, appropriately adapted, can be submitted to a selected group of market participants (customers, suppliers and/or competitors), since, given their knowledge of the market, these are best placed to identify any factor that may have been overlooked in the ex-ante analysis.
- IV. 152 It is important to remember that in order to perform an ex-post assessment of a decision, the reviewer must only identify the missing key factors, i.e. those that, if they had been included in the analysis, may have led the Commission to take a different decision.

## ACCOMPANYING LETTER

Dear \_\_\_\_\_,

We are currently conducting an ex-post analysis of the decision made by the European Commission in the case \_\_\_\_\_  
(Commission decision of \_\_\_\_\_).

In this case, the Commission finally approved / approved with conditions / blocked the merger. The decision was mainly based on the following key arguments:

### **Description of key arguments put forward by the Commission.**

In order for us to carry out the task of evaluating the completeness of analysis that underpins the Commission's decision, it is important to ascertain if the Commission identified all the key factors. The key factors are all those characteristics of the market that determine the impact of a merger on competition on its competitors and, hence, on consumers. In other words the key factors are those that determined the decision made by the Commission and had one of them been different the Commission may have reached a different decision.

It is possible that in developing its ex-ante analysis that underpinned its decision of the merger the Commission missed one or more of these key factors. To determine if the Commission did fail to take into account one or more of these key factors and what these are, we are submitting a questionnaire to all the market participants.

As one of the main customers /competitors /suppliers /other, we kindly ask you we kindly ask you to carefully read the final decision made by the Commission in the mentioned case and answer the following questions.

## QUESTIONNAIRE

### A. DEFINITION OF THE RELEVANT PRODUCT MARKETS.

**A.1.a** The definition of the relevant product market was not key for the Commission's final decision. In your view, should the Commission have given more attention to this factor in its competitive assessment of the proposed merger?

yes	no
<input type="checkbox"/>	<input type="checkbox"/>

*Answer the next question only if you answered yes to the previous one.*

**A.1.b** Given the information available at the time of the decision, do you think that the Commission could have foreseen the importance of the relevant product market for the competitive assessment of the proposed merger?

yes	no
<input type="checkbox"/>	<input type="checkbox"/>

**A.1.c** Explain briefly why you believe that the Commission could or could not have foreseen the importance of this factor when it took the decision.

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### B. DEFINITION OF THE RELEVANT GEOGRAFIC MARKETS.

**B.1.a** The definition of the relevant geographic market was not key for the Commission's final decision. In your view, should the Commission have given considerably more attention to this factor in its competitive assessment of the proposed merger?

yes	no
<input type="checkbox"/>	<input type="checkbox"/>

*Answer the next question if you answered yes to the previous one.*

**B.1.b** Given the information available at the time of the decision, do you think that the Commission could have foreseen the importance of the relevant geographic market for the competitive assessment of the proposed merger?

yes	no
<input type="checkbox"/>	<input type="checkbox"/>

**B.1.c** Explain briefly why you believe that the Commission could or could not have foreseen the importance of this factor when it took the decision.

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**C. MODE OF COMPETITION.**

**C.1.a** The specific mode of competition was not key for the Commission's final decision. In your view, should the Commission have assessed the proposed merger in the context of a specific mode of competition?

yes	no
<input type="checkbox"/>	<input type="checkbox"/>

*Answer the two next questions if you answered yes to the previous one.*

**C.1.b** In your view, of the following modes of competition, which one describes best the competitive constraints faced by the parties proposing the merger?

Cournot (homogeneous products and quantity competition)	Bertrand (differentiated products and price competition)	Bidding market (less frequent large single-unit auctions)	Procurement market (frequent, medium- small or multiunit auctions)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**C.1.c** Given the information available at the time of the decision, do you think that the Commission could have foreseen the importance of the mode of competition for the assessment of the competitive effects of the proposed merger?

yes	No
<input type="checkbox"/>	<input type="checkbox"/>

**C.1.c** Explain briefly why you believe that the Commission could or could not have foreseen the importance of this factor when it took the decision.

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**D. UNILATERAL EFFECTS.**

**D.1.a** Concerns that the merger would give rise to unilateral anticompetitive effects were not key for the Commission's final decision. In your view, should the Commission have given considerably more attention to these factors in its competitive assessment of the proposed merger?

yes	no
<input type="checkbox"/>	<input type="checkbox"/>

*Answer the next question if you answered yes to the previous question.*

**D.1.b** Given the information available at the time of the decision, do you think that the Commission could have foreseen the importance of this factor for the competitive assessment of the proposed merger?

yes	no
<input type="checkbox"/>	<input type="checkbox"/>

**D.1.c** Explain briefly why you believe that the Commission could or could not have foreseen the importance of this factor when it took the decision.

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**E. COORDINATED EFFECTS.**

**E.1.a** The ability of the coordinating firms to reach a common understanding about a tacit agreement with the purpose of coordinating their behaviours so as to limit competition was not key for the Commission's final decision. In your view, should the Commission have given considerably more attention to this factor in its competitive assessment of the proposed merger?

yes	no
<input type="checkbox"/>	<input type="checkbox"/>

*Answer the next question if you answered yes to the previous question.*

**E.1.b** Given the information available at the time of the decision, do you think that the Commission could have foreseen the importance of this factor for the competitive assessment of the proposed merger?

yes	no
<input type="checkbox"/>	<input type="checkbox"/>

**E.1.c** Explain briefly why you believe that the Commission could or could not have foreseen the importance of this factor when it took the decision.

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**F. COUNTERVAILING FACTORS.**

**F.1.a** The likelihood of future entry by new firms in the following two years was not key for the Commission's final decision. In your view, should the Commission have given considerably more attention to this factor in its competitive assessment of the proposed merger?

yes	no
<input type="checkbox"/>	<input type="checkbox"/>

*Answer the next question if you answered yes to the previous one.*

**F.1.b** Given the information available at the time of the decision, do you think that the Commission could have foreseen the importance of this factor for the competitive assessment of the proposed merger?

yes	no
<input type="checkbox"/>	<input type="checkbox"/>

**F.1.c** Explain briefly why you believe that the Commission could or could not have foreseen the importance of this factor when it took the decision.

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**G. OPEN QUESTIONS.**

**G.1.a** The previous questions are unlikely to cover all possible factors that the Commission may have missed in its analysis of the proposed merger. Are there other key factors that the Commission did not take into account in its decision? If so please list them below.

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**G.1.b** Do you think that the Commission could have foreseen the importance of each of the above missing factors for the competitive assessment of the proposed merger? Please discuss this separately for each one.

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

**G.2.** Please rank all factors mentioned in this questionnaire, including those provided by you in question G.1, according to their importance in the analysis that underpins the decision. Start with the most important one and end with the least important one.

MOST IMPORTANT

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

LEAST IMPORTANT

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