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Market definition in recent EC
merger investigations:
The role of empirical analysis

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Market definition in recent EC merger investigations: The role of empirical analysis

Abstract

Over the past few years, the Commission has increasingly used sophisticated tools for market definition purposes, and the use of empirical evidence is now common practice for market definition. Market definition is based on the SSNIP test that examines whether a hypothetical monopolist would profitably and permanently increase prices by 5-10% in a given candidate market. There are two types of empirical analyses (critical loss analysis and pricing analysis) that have by now become standard parts of the Commission's "toolkit" for defining markets. The aim of this article is to provide an overview of these empirical tests and to illustrate how they were used by the Commission in a number of recent EC merger cases.

Depuis plusieurs années, la Commission européenne utilise de plus en plus des outils sophistiqués pour la définition du marché pertinent; l'utilisation des techniques empiriques est maintenant une pratique commune. La définition du marché pertinent est basée sur le test SSNIP (augmentation faible mais significative et durable du prix). Ce test examine si un "monopoleur hypothétique"(hypotetical monopoly test) augmenterait les prix de 5-10 % de façon rentable et durable dans un marché candidat donné. Deux types d'analyses empiriques font désormais partie de la boîte à outils de la Commission européenne dans son appréciation du marché pertinent : l'analyse des pertes critiques (critical loss analysis) et l'analyse des prix (pricing analysis). Le but de cet article est de donner un aperçu de ces techniques empiriques et d'illustrer la façon dont elles ont été utilisées par la Commission européenne dans des cas récents de fusion soumis à son analyse.

* The views expressed in this article are those of the two authors and should not be considered as representative of the official position of DG COMP or the European Commission. The authors would also like to thank Svend Albaek, Penelope Papandropoulos and, in particular, Raphaël De Coninck for helpful comments and discussions.

1. Over the past few years, the Commission has increasingly used sophisticated tools for market definition purposes, and the use of empirical evidence is now common practice for market definition. Quantitative evidence can often provide important insights to the SSNIP test that examines whether a hypothetical monopolist would profitably and permanently increase prices by 5-10% in a given candidate market. This is because it can directly assess the reactions of customers and competing suppliers to the price increase. In particular, it aims to evaluate whether customers would switch a sufficient amount of their purchases from the hypothetical monopolist in a candidate market to competing products of suppliers outside the candidate market and whether these suppliers would be able to and have sufficient incentives to supply the customers of the hypothetical monopolist.

2. Consider a stylized example in which there are only two firms producing a particular product, and these two firms merge. If this product forms a relevant product market, then the merger would lead to a monopoly. If the market is wider (as for example customers may substitute to other alternatives), there may be other suppliers that *sufficiently* constrain the merging firms to alleviate competition concerns. Quantitative analysis can be particularly useful in determining whether the potentially substitutable products are "close enough" to the products of the merging parties so that they could exert sufficient constraint on them post-merger. This is because although there may be two products that *prima facie* may seem as "reasonable" substitutes for the products of the merging parties, one of the products may be more substitutable for the products of the merging parties than the other. Thus, even if one concludes that both of these competing products are part of the same relevant product market along with the products of the merging parties, the competitive constraint that these products exert on the merging parties may be different. One should thus think of market definition as an initial "discrete" exercise that identifies whether a particular product is in a relevant product market or not, which however does not imply that all the products in the market exert the same constraint on the products of the merging parties.[1]

3. The aim of this article is to provide an overview of the type of empirical tests that the Commission is routinely using for delineating markets. In particular, this article discusses the advantages and disadvantages of the two basic types of empirical methods that lend themselves particularly well to the assessment of the hypothetical monopolist test and illustrates how they were used in a number of recent EC merger cases. The first type of analysis, the critical loss analysis, directly assesses whether a price increase of 5-10% is profitable by comparing by how much the hypothetical monopolist's quantity sales would have to decrease to make a price increase unprofitable (i.e. the critical loss) with an actual loss that the hypothetical monopolist would incur in response to the same price increase. The second type of analysis, the pricing analysis, uses the key intuition that if two products are in the same relevant market, then competition between them would be sufficiently strong to ensure that any "misalignment" between their prices would only be temporary, as consumers would switch from the "high price" product to the "low price" product. Thus, this analysis clearly only approximates the SSNIP test, as it does not provide a direct answer for whether a price increase of 5-10% would be profitable or not for the hypothetical monopolist.

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1   See J. Farrell and C. Shapiro, "Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition", November 2008, that discuss the limitations of (and alternatives to) market definition in differentiated products industries (http://www.econ.berkeley.edu/~farrell/ftp/Unilateral73.pdf).

I. The underling data

4. The quality of any type of empirical analysis is dependent upon the quality of the underlying data. Hence, considerable care should be taken in constructing and cleaning the data prior to undertaking the market definition tests. Essentially, the market definition tests reviewed in this paper can be performed with data on product sales (both in terms of revenue and quantities) along with at least some product characteristics. Such data can be obtained from marketing agencies such as AC Nielsen or Gfk as these companies collect scanner data in supermarkets and report aggregate statistics for each country such as the total quantities sold of a given product in a given country and the average market price at which this product is sold.[2] Alternatively, the merging parties' own accounting systems store information for every sale that a firm makes (the so-called transaction-level data), including the date of sale, the type of the product sold, customer name and its location, the quantity of the product sold, sales revenues and the production costs. This data can also be used to create average product prices by aggregating over all the sales that the merging parties make.[3]

6. The key difference between the data from the marketing agencies and the data from the merging parties is that while the data from the marketing agencies report *market-level* prices and quantities that can usually be directly used for the SSNIP test, the merging parties' data only pertains to information on the *parties' own* prices and quantities, and thus such data does not usually correspond to market-level statistics. This however does not mean that such data would not be useful for market definition, because the merging parties' price and quantity decisions provide useful evidence as to the competitive constraints that they face in each market in which they operate.[4] Moreover, it is also noteworthy that the Commission recently obtained the transaction-level data from all the main competitors (in addition to the merging parties) in a number of transactions and was thus able to reconstruct market-level prices for the market definition tests.[5] Thus, even if no publically available data exists on market-level prices, this information can still be collected during the merger proceedings.

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2   Such data is usually constructed by collecting the required information in supermarkets that account for a large percentage of total sales and is extrapolated to construct the total amount of sales of the given product in a given country.

3   While the marketing data has been usually cleaned by the agencies prior to constructing the country-level statistics, the transaction-level data may possibly be subject to a number of outliers. For example, customers may often return the products they purchased, and such returns are often recorded with negative revenues and negative quantities sold. If such a return is large enough as a percentage of the total sales in any given month, this may influence the weighted average price in that particular month and, as a result, the pricing analysis. It is thus customary prior to constructing the average prices to purge from the analysis all observations with non-sensical values such as negative revenues and quantities, and observations whose prices are either too high or too low compared to what we would expect the customers to pay for the products.

4   For example, if a firm sets prices of two products such that their prices move closely together over time, this would be consistent with the two products being in the same market.

II. Critical loss analysis

1. Overview

7. The concept of Critical Loss Analysis (CLA) is derived directly from the definition of an antitrust market contained in the Commission's notice on market definition: a relevant antitrust market is the smallest group of producers that, if they behaved as a single hypothetical profit-maximizing firm, would impose at least a small but significant and non-transitory price increase of 5-10% (SSNIP).[6,7] The logic of the test is to identify a group of producers that would be able to exercise market power if they could coordinate their pricing and output behaviour. The standard hypothetical monopolist test starts with the smallest possible candidate market (i.e. products of the merging parties), asks whether a hypothetical monopolist could profitably impose a SSNIP, and progressively broadens the market by adding the nearest substitute products up to the point when such a price increase is profitable for the first time.

8. The price increase contemplated by the SSNIP test has two opposing effects on the hypothetical monopolist's profits. On one hand, it has a negative effect on profits because sales will fall as some consumers buy less or substitute to rival firms' products in response to the increase in price. On the other hand, there is an offsetting positive effect on profits as the hypothetical monopolist now earns higher margins on all of the remaining sales. The purpose of CLA is to evaluate this trade-off and thus to determine whether the price increase is profitable or not by way of comparing *the critical loss* and *the actual loss* due to the price increase. The critical loss is the percentage reduction in quantity such that the two effects just balance out, i.e. the gains from the price increase are exactly offset by the losses. The actual loss is the actual percentage reduction in quantity that the hypothetical monopolist would realize in the candidate market in the event of such a price increase. If the actual reduction in unit sales is greater than the critical loss, then the price increase will be unprofitable (as customers would switch to other competitors that would be willing to supply enough sales to them) and the candidate market has to be expanded (as there are other credible competing products in the market). If the actual reduction in unit sales is less then the critical loss, the price increase will be profitable, and the candidate market is indeed the relevant market (as customers are unable to switch to other competing products).

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5   Examples include COMP/M. 4513 *Arjowiggins/M-real Zanders Reflex*, COMP/M. 5153 *Arsenal/DSP*, COMP/M. 4980 *ABF/GBI* and COMP/M. 4989 *Alo/MX*.

6   See the Commission Notice on the definition of the relevant market for the purposes of Community competition law (Official Journal C 372, 09.12.1997):
http://ec.europa.eu/competition/mergers/legislation/notices_on_substance.html#relevant_market.

7   It is important to note that in merger analysis the relevant counterfactual for the market-level prices are the currently observed prices. This is different from Article 81/Article 82 investigations, where it first must be estimated how the prices would look like absent the infringement to correctly define how wide the market is.

10. Undertaking CLA thus requires the computation of two values (critical loss and actual loss). The *critical loss* computation is rather straightforward, as it is based on a simple formula and only requires information on contribution margins.[8] However, as the contribution margin depends on the average product price and variable costs, *correct* information on these variables must be collected. In particular, contribution margin should identify the cost savings realized by a reduction in output in the *relevant* time period that is considered to be around 2 years for merger control purposes. It is thus imperative that total costs are correctly divided between variable and fixed costs, as a poor identification of variable costs can lead to relevant markets which are broader than they actually are (i.e. when margins are too high) or to markets that are defined as too narrow (i.e. when margins are too low). Additionally, the contribution margin must reflect the costs of all firms in the provisional market, and thus it may be necessary to obtain comparable price and cost information for all market participants and not just the parties. It may also be important in some specific instances to make adjustments to the basic critical loss formula to account for special features of a particular industry.[9] Thus, all these elements must be taken into account when calculating the critical loss.

11. To compute the actual loss, reaction of consumers (and competitors) must be modelled to the 5-10% price increase. The most direct way to model this reaction is by estimating the elasticity of demand that captures how much demand for a product changes when the price of the product changes. Demand estimation however has very high data requirements and may sometimes place quite restrictive assumptions on consumer behaviour and thus may often result in rather non-robust estimates or no estimates at all.[10] Although less precise than demand estimation, demand elasticity can also be approximated by taking advantage of exogenous price shocks (if they exist) such as for example exchange rate shocks, as one can compute by how much the demand changed in response to this particular price change.[11]

12. There are also other ways how actual loss can be estimated. For example,, it may also be estimated with a use of an accurate customer survey that directly asks a large enough group of customers whether they would switch to a different product in response to a 5-10% price increase of the product of interest.[12] By collating the number of customers that would switch as opposed to the number of customers that would not switch in response to the price increase, the actual percentage loss of customers can be calculated. Qualitative evidence on how customers responded to sudden shocks or on past switching customer behaviour between different products can also be used as a "rough guide" for the magnitude of actual loss, although the evidentiary value of such analyses tends to be lower.

2. Applications in recent EC merger investigations: COMP/M. 4734 *Ineos/Kerling* and COMP/M. 5335 *Lufthansa/SN Airholding*

13. The issues raised above have been recently discussed in two merger cases that are discussed below. In particular, COMP/M. 4734 *Ineos/Kerling* demonstrates the difficulties in the estimation of the actual loss using (partial) demand analysis and what type of evidence can be obtained to convincingly approximate the actual loss even if one cannot rely on the results of the demand analysis. On the other hand, while it was relatively straightforward to estimate the actual loss with a survey in a recent airline merger COMP/M. 5335 *Lufthansa/SN Airholding*, the calculation of critical loss relied on some very restrictive assumptions, and thus the findings were not considered to be appropriate for market definition purposes.[13]

14. The main issue in the *Ineos/Kerling* transaction was the assessment of whether the UK forms its own market for S-PVC (as the parties were the only two UK producers and would thus be merging to monopoly), or whether competing producers that export S-PVC to the UK are a sufficiently strong competitive force, and thus the UK is part of a wider market that encompasses other regions such as Western Europe.[14] Calculating the critical loss amounted to using the standard formula based on the transaction-level data (such as product prices and variable costs for each sale) that was collected from the merging parties and third parties. However, to compute the actual loss, it was necessary to undertake residual demand analysis to estimate the relevant demand elasticities to capture the relationship between the prices of the merging parties and the quantity of imports. This estimation however did not provide any robust estimates, as the behaviour of both the merging parties and the potentially competing importers were subject to very similar shocks (as S-PVC is an oil derivate with world-wide prices), and thus the residual demand analysis could not disentangle the relationship between Ineos and Kerling from the relationship between the merging parties and the importers from Western Europe.[15]

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8   The basic formula for the critical loss ($\triangle Q/Q$) is ($\triangle P/P$) / ($\triangle P/P$ + CM) where $\triangle P/P$ is equal to the hypothesized price increase (e.g. 5%) and CM is equal to the contribution margin of the producers in the group. The contribution margin is defined as the percentage of the product price (prior to the price increase) that the difference between the product price (prior to the price increase) and the average variable costs accounts for.

9   For example, when a by-product is created by the production of the product in the provisional market from which revenues are derived, the critical loss must reflect the lost revenues associated with the lost sales of the by-products adjusted for any cost savings.

10   For an extensive overview of demand estimation and the problems associated with this empirical method, see Ian Small, "Econometric analyses of unilateral effects in merger cases", N° 2-2009, n° 25835, www.concurrences.com.

11   These calculations are less precise, because they do not control for all the other elements that may have an effect on changes in demand and also pertain to only a given point in time.

12   It should be noted that customer surveys are often costly in terms of time and resources.

13   COMP/M. 5141 *KLM/Martinair* is another airline merger, in which the use of CLA was discussed.

14   S-PVC ("suspension polyvinyl chloride") is for example used for the production of plastic pipes and window frames.

15   To see this, note that the prices of the merging parties and the importers were all moving in the same way as a result of the common oil shocks, and thus for example the effect of Kerling's own price changes on its sales were very similar to those of Ineos and of the importers. As a result, the estimation procedure could not properly identify the relevant elasticity parameters that precisely capture the relationship between the quantity and prices.

15. The Commission thus had to rely on other pieces of evidence that suggested that, *when combined together*, it is likely that the actual loss would be higher than the critical loss. In particular, this evidence suggested that (i) the competing producers had uncommitted capacity that was comparable to the amount of critical loss, (ii) switching analysis suggested that the customers of the merging parties switched an important amount of their purchases to competing producers in the past, and (iii) when one of Ineos' plants unexpectedly shut down, third parties (in addition to Kerling) were able to respond by increasing supplies to the UK with no evidence of price increases or changes of the merging parties' margins. There was thus enough evidence to conclude that the market for S-PVC is likely broader than the UK.

16. One of the key issues in the *Lufthansa/SN Airholding* airline merger was the product market definition on the Brussels-Frankfurt route, and in particular whether air travel competes with train travel. While it was relatively straightforward to estimate the actual loss with a survey that was conducted at the airport gates in Brussels by asking respondents whether they would have decided to travel by train if airfare was 5-10% more expensive, the calculation of the critical loss brought up a number of issues. First, while critical loss analysis assumes that a single price is charged to all customers, the airline industry is characterized by significant price discrimination (as for example business passengers tend to pay significantly higher prices than leisure passengers). It thus does not seem to be reasonable to expect (as the CLA assumes) a hypothetical monopolist to increase the *average* price by 5-10%.[16]

17. Second, notwithstanding the fact that the gross margins will differ significantly across the different customers according to what they paid for their tickets (and thus the average gross margin on which the critical loss is based is likely not appropriate for the CLA calculations), the application of CLA to an airline industry that is characterized by high fixed costs also brings up an important question of what the appropriate measures of variable costs and hence gross margins are. In particular, while it is true that in the short-run, variable costs per seat are likely best approximated by catering and fuel costs along with departure taxes, the 5-10% price increase may actually (over the two-year time horizon that is relevant for merger control) have an effect on the number of frequencies/airplanes that the airline may use on a given route. It is thus important to properly measure the effect of the price increase on the behaviour of the airline, otherwise the estimate of the variable costs may be too low (and the margins too high), which may incorrectly imply that the market is wide, and air travel competes with train travel (as the critical loss may be lower than it would be in reality). For example, sensitivity analysis can be used for that purpose to test what effect different assumptions on costs have on the magnitude of the critical loss.

III. Pricing analysis

1. Overview

18. As was seen in the preceding section, although critical loss analysis directly evaluates the SSNIP test, it is fairly difficult to implement. Pricing analysis, on one hand, does not provide a direct answer to the SSNIP test, as for example a finding that prices of two products move closely together does not provide any insights as to the causality of the relationship between the prices.[17]. On the other hand, pricing analysis uses straightforward and easy-to-implement empirical techniques. There is thus a trade-off between the evidentiary value of the findings from the pricing analysis and the ease with which the pricing analysis can be implemented. To alleviate such concerns, it is thus always important to complement the findings from the pricing analysis with some factual evidence that explains how the competing producers constrain the hypothetical monopolist.

19. Two techniques can be used to examine the extent to which prices move together over time. The first technique, the *correlation analysis*, measures the extent (summarized by the correlation coefficient) to which the movements in the price of one product are closely associated with the movements in the price of another product. If the prices of the two products move perfectly in line with each other, the correlation coefficient is one. If there is no relationship between the prices, the correlation coefficient is zero.

20. As the correlation coefficient can vary between zero and one, to assess whether prices are *sufficiently* correlated to consider two products or geographic areas to be in the same market, it is typical to use as a benchmark the correlation between two products or areas that can be safely considered to be part of the same market. For example, if it is accepted that the geographic market is EEA-wide, and the issue to examine is whether the market is world-wide, this implies that the correlations between the prices of the different Member states may be used as useful benchmark against which the price correlations of the different continents can be compared.[18]

21. *Stationarity analysis*, the second technique used for pricing analysis, examines whether the price of one product relative to a price of another product oscillates around a constant value that is close to one over time. If it does (i.e. the relative price is stationary), this implies that the two products are in the same market, as the prices can only deviate from each other for a

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16   Instead, it is likely that the hypothetical monopolist would increase prices to (price-insensitive) business passengers by a larger amount than to leisure (price-sensitive) passengers.

17   Consider for example a hypothetical monopolist in country A that produces a particular product. Finding that the prices of this product move closely with prices of products of competing producers in surrounding countries does not provide any evidence for whether the competing producers provide a constraint on the hypothetical monopolist, or whether the competing producers simply follow the prices set by the hypothetical monopolist. Obviously, for merger control purposes, the latter rather than the former is required.

18   Of course, there may also be instances, in which no benchmark is readily available. In such a case, a view must be taken on what level of correlation is high enough to indicate that two products or geographic areas are in the same market.

short period of time. Consider, for example, Figure 1 below that displays a hypothetical price of a product in Member State A relative to a hypothetical price of a product in Member State B. As the relative price oscillates around 1, this implies that the prices in the two Member States are on average the same, which is consistent with the two Member States being in the same market.

22. Both analyses should be viewed as complements rather than substitutes, as each has its own advantages and disadvantages. While the key advantage of correlation analysis is that it is fairly easy to implement, it suffers from some important shortcomings that need to be taken into account when interpreting the results.[19] Stationarity tests, on one hand, avoid most of the issues that correlation analysis is suspect to and also do not require any benchmarks. On the other hand, they involve sophisticated econometric tests that are more difficult to implement and can also result in misleading findings due to for example a presence of a number of structural breaks in the relative prices.

2. Applications in recent EC merger investigations: COMP/M. 4513 *Arjowiggins/M-real Zanders Reflex*

23. The issues that arise while defining markets were discussed in great detail in the COMP/M. 4513 *Arjowiggins/M-real Zanders Reflex* and COMP/M. 5153 *Arsenal/DSP* decisions. These decisions both contain detailed annexes presenting the Commission's analyses and preferred empirical techniques but also discussing the arguments and alternative empirical analyses that were put forward by the notifying parties. In addition, pricing analysis played an important role in the Phase II investigations in COMP/M. 4989 *Älo/MX* and COMP/M. 4799 *OMV/MOL*, as well as in Phase I investigation of COMP/M. 5190 *Nordic Capital/Convatec*. Given that the *Arjowiggins/Reflex* transaction case nicely demonstrates the use of all the different tools of pricing analysis, the remainder of this section discusses this case in a greater detail to demonstrate the technical framework of pricing analysis for delineating markets.

24. The key market reviewed in this transaction was the carbonless paper market. Carbonless paper comprises of three layers of paper (CB top sheet, CFB middle sheet, and CF bottom sheet) and is used to make duplicate copies without a carbon layer. It is sold either in reels or sheets (sheets are created by cutting reels into smaller pieces). In an all-carbonless EEA-wide market, the combined entity would have around half of the market (with the top five producers

accounting for about 90% of the market). The position of the merged entity would however be significantly more pronounced if national markets for reels and sheets were considered separately, as the market share data showed significant variations among the different national markets.[20] Thus, the Commission undertook pricing analysis to examine whether (i) the carbonless market should be split into separate reels and sheets markets, and (ii) whether national boundaries defined geographic markets, or whether there was a single EEA-wide market.

25. To determine whether reels and sheets are in the same product market, correlation coefficients were calculated for six Member States to see how closely the market prices of reels and sheets move.[21] The resulting correlations ranged from -0.32 to 0.50 and on their own suggested that prices of reels and sheets do not move closely together. This conclusion was further strengthened with the use of benchmarking, as it was accepted that the three layers of carbonless paper (CB, CF and CFB) are all part of the same market based on the qualitative results of the market investigation and the finding that almost all correlation coefficients between the three layers of carbonless paper (CB, CF and CFB) ranged from 0.8 to 0.98. It thus followed that reels are sheets were unlikely to be in the same market, as the correlation coefficients between reels and sheets were significantly lower than the correlations between the three layers of carbonless paper.[22]

26. While there was a natural benchmark to use for the delineation of the product market, there was no obvious benchmark with respect to the geographic market is. The market definition analysis thus primarily relied on stationarity tests, particularly for the reels market, given that the evidence from the correlation analysis was somewhat mixed. As Figure 2 suggests, the French, Polish and Italian prices appear to move more closely together, which may be consistent with these three Member States being in the same market, although this finding can be also driven by movements in input costs (such as for example paper pulp).[23] Taking France as an example, the stationarity analysis tested whether the reels prices in the other five chosen Member States relative to the French prices that are plotted in Figure 3 below are stationary, which would be consistent with France being part of a wider market. The downward trends in the relative reels prices that are visible in Figure 3 are however not consistent with a geographic market that would be wider than France (as the prices of French reels are getting over time relatively more

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[18] There are, for example, instances, in which high correlations could be entirely driven by changes in common elements (such as common cost movements or currency movements), and thus two markets may be defined as belonging to the same market, although the prices may in reality not be directly related to each other (but rather driven by a common cost element). Alternatively, prices of two markets may be related to each other but one of the price series may be subject to significant random disturbances at some point in time or may respond to changes in market conditions with a time lag, which may result in very low correlation coefficients, as correlation analysis examines contemporaneous movements over time.

[20] For example, compared to about half of the market at the EEA-level, the merged entity would have 70-80% of the German sheets market, 60-70% of the French sheets market, and 70-80% of the Italian reels market.

[21] Monthly volume and value sales of reels and sheets for each of the three layers of carbonless paper in each Member State were submitted to the Commission by the five largest producers of carbonless paper for a three year period. Given that six out of the twenty-nine EEA countries accounted for around three quarters of the total carbonless paper sales in the EEA over the period, the analysis concentrated on those six countries (Germany, France, Italy, Poland, Spain and the UK).

[22] The stationarity analysis led to the same finding.

[23] The price series could also be adjusted for paper pulp costs that were however not available to the Commission, and such adjusted prices could have been used for the correlation analysis.

expensive compared to the other countries), which formal stationarity tests further confirmed. As similar results were found for the other Member States, the stationarity analysis did not provide any robust evidence that would be consistent with the different Member States being in the same relevant geographic market.

IV. Conclusions

27. This article describes two important types of empirical tools used for delineating markets: critical loss analysis and pricing analysis. Each of these methods has its own advantages and disadvantages and they are thus in principle complementary. In particular, on one hand, critical loss analysis provides a direct answer to the SSNIP test, while pricing analysis only approximates it and thus must be complemented with other qualitative findings to provide convincing evidence as to how wide the market is. On the other hand, critical loss analysis requires the estimation of the actual loss of customers in response to the 5-10% price increase, which is fairly complicated and can be extremely costly in terms of time and data requirements, while pricing analysis uses empirical techniques that are easy to implement.

28. Pricing analysis seems to be particularly well-suited for investigations during Phase I proceedings due to the timing constraints of Phase I and the inherent difficulties with the estimation of the actual loss in the critical loss analysis. Undertaking critical loss analysis is more suitable (subject to the caveats regarding the complications that this method brings about) for Phase II investigations, when more time is available to perform sophisticated empirical tests. However, more importantly, both of these complementary methods are by now standard parts of the "toolkit" used by the Commission in merger investigations to complement the market investigation when defining markets. ◾

Annex

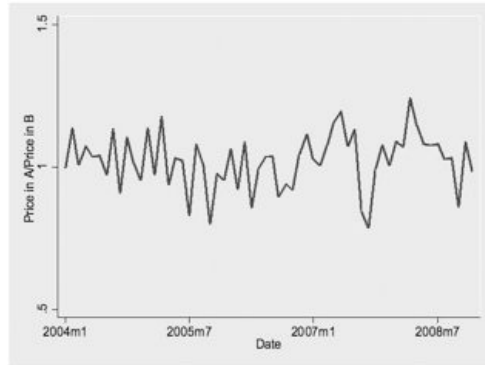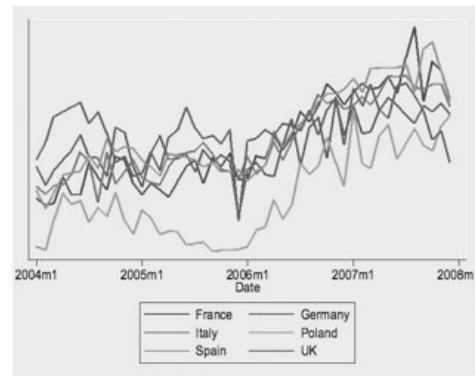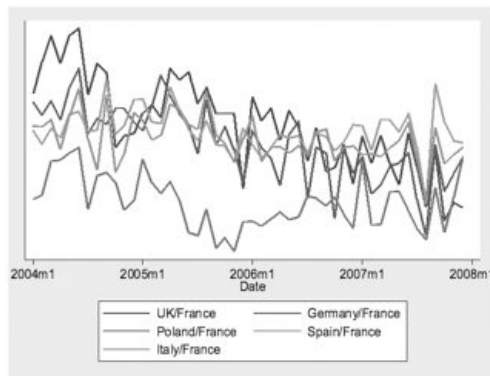**Figure 1: Stationary relative price**

Figure 2: Average net prices of reels

Source: Sales data from the five largest producers of carbonless paper

Figure 3: Average country reels prices relative to net prices of reels in France

Source: Sales data from the five largest producers of carbonless paper

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