Relevant market definition

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General definition of the market

A general definition of market derives from previous definitions of the agents involved, that are, *at least*,

- a buyer, or consumer
- a seller, or producer

and from the identification of a *geographic area* where some trade *might* take place.

Naturally, *trade* is the (possible) action of buying and selling goods and/or services.

General definition of the market

A general definition of market hence requires *at least* four dimensions. To recap:

1. A buyer, or consumer;
2. a seller, or producer;
3. a geographic area;
4. some products or services.

Playing with those four dimensions allows you to change the market structure.

Definition of the Relevant market

- The general definition of *market* is too wide to be practically useful for our purposes.
- It might be the case to consider adding another dimension in order to restrict the area of interest and make it more manageable.

$$\Downarrow$$

- We are going to add the *time* dimension to the original set of variables.

Definition of the Relevant market

- A **relevant market** is the smallest portion of trade on which one or more undertakings can effectively exert a significant level of market power for a non-transitory period of time.
- For **market power** we consider the ability of one or more firms to price above the perfectly competitive level.
- How to measure market power? With the *Lerner Index* for example!

$$L = \frac{p - MC}{p} \qquad p > 0$$

Notice how that of relevant market is a notion specific to competition law.

Definition of the Relevant market

- The definition of the relevant market is a key instrument to identify and define the boundaries of competition between firms.

$$\Downarrow$$

- What market players can be considered direct competitors?
- Do they produce, or have the capabilities to produce, products that are *substitutes*, so that they could limit one another's power to raise prices?

The Smallest market principle

- An important tool to proxy and define the relevant market is the so-called Smallest market principle.
- The smallest market principle shall guide the *Antitrust authority* when evaluating between similarly plausible alternatives.
  - Restrict the geographic area;
  - differentiate the products (e.g. *are there evident qualities that set your product apart from other similar products?*);
  - etc...
- ⚠ Do not overdo it: dealing with a too narrow market may as well prevent the correct assessment of competitive risks.

The Smallest market principle

Example 1: The bike manufacturers

As director of the *Antitrust authority*, you were notified of a proposed merger between *i*) a large manufacturer of industrially produced mountain bikes and *ii*) a small producer of high quality carbon fibre bikes. How would you proceed? To start, it might be a good idea to tentatively identify two *candidate* markets:

- of cheap mountain bikes
- of high quality carbon fibre bikes

rather than a single market encompassing all kinds of bikes. Obviously enough, a market definition for *i*) black mountain bikes, *ii*) white mountain bikes, *iii*) black carbon fibre bikes, *iv*) white carbon fibre bikes, *etc...* would definitely be too narrow!

Market definition

- The key task, when delineating a market's boundaries, is to identify the **competitive constraints** that undertakings face:
  - those factors that limit their ability to exert market power for a prolonged period of time.
- Constraints can be of two types: there can be *constraints from the demand-side*, and *constraints from the supply-side*.

Market definition

Market definition serves three main purposes:

- To focus the analysis on the type of trade and on the geographic areas in which a competitive concern *may* arise;
- to identify market participants and to measure market shares and market concentration, which are commonly used for a preliminary assessment of market power;
- to shed light on the state of the competition among the market participants, foresee its evolution, and help assessing the existence of barriers to entry.

A multiple-step procedure

The market definition process can be decomposed in three phases:

1. a *Preliminary* phase;
2. a *First screening*-phase;
3. a *In depth analysis*-phase.

Notice that you can exit the procedure at any step if the requirements needed for your inquiry are matched, even if you haven't reached a super precise definition of the relevant market. $\Rightarrow$ The *Antitrust authority* shall define a relevant antitrust market <u>only</u> when it is *necessary to make an informed decision*, and shall stop the procedure as soon as a *reliable conclusion* on the competitive issue <u>under scrutiny</u> can be drawn.

Preliminary phase

The preliminary phase is concerned with the correct identification of the competitive problem under scrutiny in order to orient the subsequent phases of the analysis. The *Antitrust authority* shall answer three questions specific to the current investigation:

1. What is the specific problem (the *competitive risk*) to be examined?
2. What are the focal product(s) and the focal area(s)?
3. Is the definition of *relevant antitrust market(s)* needed?

Preliminary phase

Example 2: Cartel investigation

Market definition is a prerequisite for market shares (MS) calculation. In an investigation over an alleged *cartel*, MS may provide information about the risk of an actual damage to the affected market.
In these cases, however, MS are usually *inessential to establish an infringement*, and a cursory market definition might suffice in conveying a broad idea of the dimension of the undertakings involved.

Preliminary phase

Example 3: Collusion during an auction

Similarly, there is no need to define a relevant market when the assessment of the conduct under scrutiny <u>does not depend on its definition</u>, for example when it is clear that the parties colluded before presenting their offers in an auction.

Focal product(s) and focal area(s)

Along with the specific competitive issue under scrutiny, the *Antitrust authority* shall identify one or more focal product(s) and focal area(s).

- A focal product is the product under investigation.
  - When the investigation concerns more than one product, then each of them is a focal product.
- A focal area is the area under investigation in which the focal product is sold.
  - When the focal product is sold in multiple areas, but *risk* arises for one area only, then this area is the focal area.
  - Sometimes it might be appropriate to identify many different focal areas, when the market is divided for some reason.

Example 4: Cola-Cola wants to merge

Suppose that a firm that produces *i*) colas, *ii*) juices and teas, and *iii*) sports drinks (let's call it *Cola-Cola*), wanted to merge with another firm that does colas only (*Only-Coke, LLP*). Suppose that, for the submission of the merger, *Cola-Cola* suggested that the merger should be assessed within the "refreshing drink relevant market", which includes colas, juices, *etc...*, and a second option, recommended the relevant market to be *at least* not narrower than "soft drinks in general". However, since *Only-Coke* focuses its production on colas only (which is produced by *Cola-Cola* as well), the focal product is **colas**. This does not prevent the *Antitrust authority* from considering whether *soft drinks* in general may be good enough demand- or supply-side substitutes to colas. Nevertheless, the starting point must be "colas".

First screening

- Once the *Antitrust authority* has assessed that market definition is an appropriate tool for the specific investigation, a first screening is carried on.
- During this second phase, the *Antitrust authority* shall answer three questions:
    1. What are the candidate market(s)?
    2. Can reliable conclusions, based on candidate (or tentative) definitions alone, be drawn? *In other words*: is it possible to leave the exact market definition open?
    3. If that is not possible, then what are the key aspects that are in need of further investigations?

Candidate market definition

A **candidate** (or *tentative*) **market definition** is a preliminary but plausible description of a possible relevant antitrust market, including both *i*) a *product* and *ii*) a *geographic dimension*.

- It is generally appropriate to define multiple candidate market definitions.
- A tentative market definition is not substantially different from properly defined relevant market.
  - However, a candidate market is defined before extensive evidence has been gathered.

Candidate market definition

Tentative definitions are important as they:

- serve as a work hypotheses to assess whether a further inquire is needed;
- represent the starting point for the practical implementation of the HM test[1] and of the SSNIP test[2] (*we'll deal with them later*);
- orient the design of an appropriate *In depth analysis* and ease the collection of relevant evidence and the construction of quantitative-based tests.

[1] Hypothetical Monopolist test.

[2] Small but Significant and Non-transitory Increase in Price test.

Product market dimension

- It is often practical to identify the candidate product market first, and only then define the geographic market.
- The starting point is the focal products previously identified, with their **closest substitutes**.
  - Substitute products do not need to be identical in order to be included in the same market!

Example 5: Demand-side substitutability

Apple and pears aren't –of course– identical. However, depending on the case, it may be appropriate to include them in a single relevant market, because a significant proportion of consumers would be willing to switch consumption in the event of a change in relative prices.

Product market dimension

- Sometimes it might be a sensible choice to also consider *supply substitutability*. This is to strengthen some tentative definitions defined using demand-side considerations, or to suggest new candidate market definitions to be assessed.

Example 6: The auto glass repair market

Suppose the automotive glass repair sector is under scrutiny. From a demand point of view, there is no substitutability: each car needs a specific glass. However, undertakings face no additional costs in repairing glasses for different brands and models. Hence, notwithstanding the smallest market principle, it would be unwise to start with a candidate market for each and every different auto-vehicle.

Product market definition

Example 7: Cola-Cola wants to merge – Part II

With respect to the *Cola-Cola–Only-Coke* case above, supply side considerations might actually further reinforce the hypothesis that *colas* and *the other sweat flavoured drinks* belong to the same relevant market. In fact, the key ingredients (water, sugar, *etc...*) may be sourced from the same supplier, production processes may not differ too much and the same distribution network can be used for both products.

Geographic market dimension

The same considerations expressed with respect to the *product market dimension* hold true for the *geographic market dimension*:

- the focal area(s) identified in the *Preliminary phase* work well as ideal starting point for a candidate market definition;
- demand-side substitutability has a prominent role but supply side substitutability may be relevant too.
- The incidence of transport cost on the value of the product is a primary factor limiting substitutability between one area and the others.
- Fiscal, technical, cultural and legal barriers also play an important role that could substantially limit the geographic areas where firms can *effectively* compete.

When can the exact definition be left open?

- Defining an antitrust market requires balancing various types of evidence and requires exercise of judgment. When there is strong evidence that the relevant market is just one of many plausible market definitions, and when the competitive assessment is shown to be largely unaltered regardless of what market definition is adopted, then it is not necessary to define the market uniquely, and the exact definition can be left open.
- However, imagine a three-good case (say A, B and C) where the **market definition** changes according to what **product market** definition you adopt.
  - Let us imagine that if you define *product market* $= A + B + C$, the **market share** is significantly lower than *product market* $= A + B$. You may wonder why is the case, hence you need to further investigate this specific issue.

When can the exact definition be left open?

- Similar considerations hold for the **geographic market** as well. For example, in order to assess "how local" a market is (this could easily be an important element to evaluate the competitive risk), the *Antitrust authority* shall attempt to identify and collect evidence that might shed light on whether it is more appropriate a definition based on transportation time, or kilometres, or topographical obstacles, *etc...*

When can the exact definition be left open?

A real life example

Example 8: Citigroup and Schroders

In examining the proposed merger between Citigroup and Schroders, two investment banks, the European Commission left open the question whether the geographic market for investment banking was EEA-wide or national, "given that the concentration will not give rise to any competition concerns under any possible market delineation".

In depth analysis

- If it was not possible to reach reliable conclusions in the *Preliminary phase* or during the *First screening*, the *Antitrust authority* shall move to the third phase of the market definition process: the **In depth analysis**.
- the *Antitrust authority* shall carefully assess the degree of competition between different products and different areas:
  - define the set of products that impose constraints on their abilities to gain market share one another.
- General cost-efficiency considerations apply during this phase as well. The *Antitrust authority* shall focus on specific key issues that need to be addressed in order to be able to understand and solve the competitive issue under scrutiny, and STOP as soon as sufficient elements are available.

In depth analysis

- Compared to the previous phases, during the *In depth analysis* many different issues can in principle be addressed with increasing level of sophistication.
- To maintain the attention focused on the core elements and limit the scope of the analysis, the *Antitrust authority* should acknowledge that the *In depth analysis* is aimed at refining the answer to the question: "what are the main competitive constraints undertakings faces?"
- As we have already seen, there are two main sources of competitive constraints: *demand-side substitution* and *supply-side substitution*.
  - There is, however, general consensus that *demand-side substitution* is the most immediate and effective driving force.

In depth analysis

The key elements of the third phase can be sketched as follows:

1. Frame the analysis within the HM test conceptual framework.
2. Define the appropriate analyses to be performed and collect the required evidence, but pay attention at data availability and cost-efficiency considerations!
3. Assess the degree of substitutability both on *i*) the demand side and on *ii*) the supply side, both for the product market and for the geographic market dimensions.
4. Enlarge (or narrow) the relevant market definition accordingly.

The Hypothetical Monopolist test

- The **Hypothetical Monopolist test** (HM test) is the conceptual framework that supports market definition.
- It is intended as a logical path that guides the *Antitrust authority* in gathering evidence on the market boundaries.
- The HM test is applied sequentially starting from the smallest set of *i*) *products* and *ii*) *areas* in which competition can effectively be distorted or eliminated.
  - The *candidate* (*tentative*) *definitions* identified during the second phase are appropriate starting points for the analysis.
- The HM test wants to answer the question:

Would it be profitable for the hypothetical monopolist to raise the price of the relevant product by a small but significant amount above the competitive level for a prolonged period of time?

The Hypothetical Monopolist test

- The aim of the HM test is to find the smallest portion of trade where a hypothetical monopolist could profitably sustain a **Small but Significant and Non-transitory Increase in Price** (SSNIP).
- Hence, if he answer to the question "Would it be profitable for the hypothetical monopolist..." is YES!, you have found the relevant market formed by the tuple $(\textit{product}, \textit{geography})$ under analysis, then apply the HM test again.
- Otherwise, if the answer is NO..., in the portion of trade considered isn't distorted, and you need to change to the initial tuple $(\textit{product}, \textit{geography})$ with something that is more likely to be the source of the identified competitive constraints.
- The procedure is iterated over and over until a set of products that satisfies the HM test is identified.

The HM test & an endogeneity issue

- Recall the question that the HM test tries to answer: would it be profitable for the firm to raise the price above the competitive price?
- You may wonder at this point how the competitive price is measured, and the answer would tragically be that normally the way is to use the *prevailing price in the market* as a proxy.
- However, you may say that the prevailing price could easily be the result of one or more undertakings exerting some market power, and that in some situations it might be that a further increase in price above the current level would be unprofitable because a sufficient number of customers would switch to alternative products.

The HM test & an endogeneity issue

- In such cases, the HM test would fail because it would suggest a wider market definition than the appropriate one, with the effect of disguising, rather that uncovering, the existence of a significant market power.
- This problem with the HM test is known as the *Cellophane Fallacy*, after the SCOTUS case *United States v. E. I. du Pont de Nemours & Co., 351 U.S. 377 (1956)*.
- In some circumstances it may be sensible for economists to consider all of the elements on actual substitution and on switching patterns and to develop an internally consistent analysis that aligns with the available factual evidence before reaching a final conclusion about the scope of the relevant market[3].

[3] From the US Department of Justice.

The Cellophane Fallacy

Example 9: United States v. E. I. du Pont

In the du Pont case, the fact that many customers were willing to switch between cellophane (a patented du Pont product) and other flexible wrapping materials (e.g. paper bag) called for a wide definition of the market to include all possible wrapping materials. Further investigations uncovered evidence that du Pont was setting the price of cellophane so high that consumers of the product would have considered replacing it with inferior substitutes.

Critical loss analysis

- A direct application of the HM test is the so called critical loss analysis.
- Critical loss analysis uses information about i) **price elasticity of demand**

$$\epsilon = \frac{dQ_d}{dP} \cdot \frac{P}{Q}$$

  and ii) **firms' costs** to answer the question of the HM test.
- It further clarifies why substitutability is the central issue in the exercise of market definition.

Critical loss analysis

The critical loss analysis tries to answer two questions:

1. How much do sales need to drop in order to make a firm indifferent between a positive increase $\alpha > 0$ and a zero increase ($\alpha = 0$) in prices?
2. If that firm eventually increased the price by $\alpha > 0$, by how much would its sales actually drop?

- The answer to the first question defines the so-called *critical loss* (CL);
- The answer to the second question defines the so-called *actual loss* (AL).

The firm would profit from an arbitrary increase $\alpha > 0$ in prices whenever $CL > AL$.

Evidence, methods and techniques to assess substitutability

- What type of evidence can be used to answer the question that can help identifying the boundaries of the market?
- Not all types of evidence will be available or relavant for each specific investigation.
- Evidence of substitutability can be either *direct* (the *Antitrust Authority* can immediately see how consumers react to changes or to a new product) or *indirect* (the *Antitrust Authority* would need to infer consumer preferences from considerations on products' peculiar features and characteristics).

Evidence, methods and techniques to assess substitutability

The *Antitrust Authority* can consider to be relevant both

- simple *qualitative information*, for instance, a list of close competitors given by a member of the firms' board committees;
- complex *quantitative estimations*, i.e. coefficients of a regression analysis.

Qualitative and quantitative evidence <u>must</u> be used together, each one, in fact, may be effective for different elements of the analysis. Using multiple techniques is also important to cross-check similar evidence from different sources.

Product market

Assessing demand-side substitutability

There would be a lot to say. We will be briefly considering a couple of quantitative tests to assess price-related evidence.

- Prices, in fact, are often key evidence for the *Antitrust Authority*'s assessment of market's competitiveness. Price data are usually easy to observe and to collect.
- Sometimes, even without resorting to quantitative price tests, conclusions can be drawn on the basis of firms' price monitoring activities. The fact that firms are monitoring one another is usually an indicator that the *monitored firm* is constraining the *monitoring firm*'s behaviors to some extent, and that the two products (or areas) may belong to the same relevant market. This type of evidence can often be found in undertakings' internal documents.

Product market

Assessing demand-side substitutability

- When no direct evidence of competitive pressure is available, *price data time series* can provide indirect evidence of the extent to which two products (or areas) belong to the same market.
- Various simple price tests are based on the intuitive idea that two products in the same market will tend to have prices that exhibit similar movements.
- The two most common analyses are:
  1. *price correlations*
  2. *stationarity analyses*

Price correlation tests

- Price correlation analysis involves comparing two price series, either across time or across space.
- The intuitive idea is that a strong positive correlation between the prices of two products suggests that they may belong to the same market.
- Price correlation tests are based on the Pearson correlation coefficient

$$\rho = \frac{cov(X, Y)}{\sigma_X \sigma_Y}$$

- However, a preliminary visual inspection of the plotted series can already convey useful information.

Price correlation tests

An example

Example 10: Price correlation tests

For the Nestlé-Perrier merger, a key question was whether the relevant market was the market for still water, the market for water or the market for soft drinks. By comparing the prices for each couple of products, it emerged that crossed-brand price correlation of still water and of sparkling water was high and of similar magnitude to same-brand correlation of still waters (close to one). In contrast, correlations between prices of water and of soft drinks were low (close to zero). This evidence underpinned the thesis of a relevant market for <u>bottled water</u>, both still and sparkling.

Stationarity tests

- Stationarity tests represent a further refinement of price tests as they rely on econometric techniques to control for the risk of spurious correlation.
- The intuition is that if two products or geographic areas belong to the same market, their prices will not move indefinitely far from each other in the long run due to possible arbitrage on the demand or on the supply side.
- Even when the sationarity test results positive, it cannot be taken *alone* as a decisive indicator that two products belong to the same relevant market.
- A more appropriate approach is to consider the result as a piece of evidence that needs to be corroborated by additional information to actually prove substitutability between the two products.

Stationarity tests

An example

Example 11: Scottish and Norwegian salmon

If you wanted to assess whether Scottish and Norwegian salmon belong to the same product market you could gather information about the prices of the Scottish and of the Norwegian product in a specific geographic area. If an econometric test for stationarity confirms that the relative price of Scottish salmon to Norwegian salmon tends to return to a constant value after any temporary deviations, one could conclude that both belong to the same relevant product market.

The economic rationale is that stationarity suggests there is direct competitive interaction; hence both products are within the same relevant market.

Product market

Assessing supply-side substitutability

- Supply-side substitutability is most likely to happen when firms produce a wide range of different qualities of a product that's not seen as substitute by consumers, but which are produced using the same or similar equipments and that can be effectively sold through the same distribution channels and marketing means.
- A key element to the assessment of supply-side substitutability is sunk costs.
- An investment or cost is *sunk* if the undertaking cannot recoup it if it decides to end the production. The higher the sunk cost, the lower the probability that switching production will be profitable.

Product market

Assessing supply-side substitutability

Example 12: Tractor trucks substitutability

Notwithstanding some differences in functional characteristics, rigid trucks and tractor trucks can be considered part of the single *heavy duty trucks* market, because the costs related to switching production are not substantial. Conversely, heavy trucks and any other truck lighter than 16 tons belong to different markets because the technical configurations are very different.