

**THE ROLE OF SUPPLY-SIDE SUBSTITUTION IN THE  
DEFINITION OF THE RELEVANT MARKET  
IN MERGER CONTROL**

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## EXECUTIVE SUMMARY

There is a wide consensus among competition authorities, legal experts and economists about the need to refer to demand-side substitutability for defining relevant markets. The same unanimity, however, does not exist in connection with supply-side substitutability. On the contrary, there seems to be substantial controversy as to the relevance of supply-side constraints for market definition. For instance, it is often argued that the stage at which supply-side substitutability is considered is largely irrelevant, provided that it is properly contemplated at some point. Those who sustain this view consider the debate on supply-side substitutability a waste of time. But although this opinion might be correct in theory, it is unlikely to be so in practice.

On the one hand, good competition policy may involve taking account of supply-side substitutability at the market definition stage because its effects on the competitive behaviour of incumbents might be equivalent to those of demand-side substitutability. Also, this may be the right policy because of the practical difficulty of overturning market share evidence on the basis of qualitative evidence on the ease of entry. And, last but not least, because there are instances where the role attributed to market shares is extended to determine the *prima facie* legal position of firms so as to regulate their behaviour. On the other hand, it might be better policy to postpone consideration of this constraint to later stages because of the difficulty of identifying supply-side substitutes and the measurement errors that will likely be made in assessing the effectiveness of this supply-side constraint.

When should supply-side constraints be taken into account? And also when should we aggregate markets on the basis of supply-side considerations? We have tried in this report to provide tentative answers to both questions. Our preferred approach can be simply described as follows.<sup>1</sup> According to standard practice, we consider it appropriate to distinguish between supply-side substitution and potential competition. Supply-side substitution should be incorporated either in the identification of market participants in order to calculate market shares, or else in the definition of the relevant market. Potential competition should, in contrast, be considered at the assessment stage in order to determine whether or not entry shall prevent the creation or strengthening of a dominant position in

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<sup>1</sup> See Summary Diagram in Section 6 below.

the relevant market. In many circumstances, however, assessing the quantitative relevance of supply-side substitution may prove too difficult, if not at all impossible. In those cases, calculating market shares for producers of supply-side substitutes may be a highly speculative exercise and, consequently, it may be better to postpone consideration of uncommitted entry to the assessment stage. This move, however, may require reconsidering the excessive weight often attributed to hard evidence on market shares vis-à-vis qualitative data on potential competition.

Consideration of supply-side substitutability constraints should lead to market aggregation only when supply-side substitution is found to be nearly universal, i.e., when production substitution among a group of products is found to be technologically feasible and economically viable for most, if not all, firms selling one or more of those products. In those cases where supply-side substitutability is not nearly universal, the market shares attributed to producers of supply-side substitutes should be based on the sales or capacity which likely would be devoted to the relevant market in response to an increase in the prices of the relevant products.

A necessary condition for two products to be considered supply-side substitutes is that the supplier of one of them already owns all the assets needed to produce the other. This applies not only to production assets, but also to marketing assets and to distribution assets, as supply-side substitution will only be effective if producers are able to market their goods, and not only to produce them, in a relatively short period of time. However, possession of all relevant assets is not enough. It is also necessary that redeploying these assets involve *no* additional investments, in particular no sunk costs. Furthermore, producers should not only be (technologically) capable to adjust their production, distribution and marketing facilities to supply the relevant products with immediacy and at a low cost; they should also find it privately profitable to divert their production, or mobilize their idle capacity, to enter the relevant market. Finally, supply-side substitution will only represent an effective competitive constraint if consumers regard the output of supply-side substitution as a valid demand substitute for the products initially taken to be part of the relevant market.

Therefore, in order to determine the viability and credibility of supply-side substitutability as a competitive constraint, competition authorities are advised to answer the following questions:

- (a) What assets are needed to produce the relevant products? In this respect, competition authorities should assess whether the manufacturers of supply-side substitutes possess the required technology, know-how, machinery and facilities; have access to the appropriate transport infrastructure and distribution channels; and, finally, possess the relevant marketing assets, such as brand name, and/or the ability to develop those assets within a reasonable period of time.
- (b) If any assets are missing, can these be acquired without the need for significant, irreversible new investments, by buying assets that involve no sunk costs and/or contracting with third parties?
- (c) Do manufacturers of supply-side substitutes have the (economic) incentives to engage in production of the relevant goods/services?
- (d) Are they able to divert production from supply-side substitutes to the relevant products, or are they contractually committed to continue production of existing products?
- (e) Do they possess unused plant capacity that can be brought into production at a reasonable cost?
- (f) Will consumers regard their products as valid substitutes for the existing set of products?

If the answers to these questions (which we denote as the “supply-side substitution test” or SSS test) were affirmative, we would be able to conclude that supply-side substitutability effectively constrains the behaviour of incumbents and that it does so as effectively as demand substitution.

But market aggregation requires more than just the existence of a few producers able to adjust their production lines in response to higher prices for the relevant products. The supply-side response should be nearly universal. Consequently, competition authorities should not only identify potential sources of supply-side substitutability but should also convince themselves about their universal character before moving on to aggregate markets for products that are not demand substitutes. This may require investigating whether most producers are already manufacturing the entire product line; most existing product lines could be easily adjusted so as to produce the relevant products; most producers have either enough spare capacity or could divert enough production from other goods to effectively respond to an increase in the prices of relevant products; and most producers have (or are likely to have) similar market positions for the various products that form the resulting

(enlarged or aggregated) relevant market. This is what we shall denote as the “near-universal substitutability test” (o NUS test).

Our approach is broadly consistent with the US *Horizontal Merger Guidelines* and it also has many points of coincidence with current European competition law and practice. Certainly, this coincidence is absolute in connection with market aggregation. The Commission’s *Notice on the definition of the relevant market* requires that “most of the suppliers” or “most if not all manufacturers” be able to produce and market the full range of products in order to enlarge the relevant product market. That is, it makes use of what we denoted as the “near-universal substitutability” test. The difference between the Commission’s approach and ours lies on the role attributed to supply-side substitution when substitutability is not nearly universal. In this case, our approach, as the US *Merger Guidelines*, recommends taking explicitly into account supply-side substitution to identify market participants and calculate market shares. On the contrary, in European competition law, supply-side substitution only plays a role in the definition of the relevant product and geographic market. If supply-side substitution considerations are not regarded to be sufficiently important so as to widen the relevant market, then the Commission will attribute them no role in the calculation of market shares.

While this approach may be appropriate for the definition of markets in many old-economy industries, it might not be so in industries where products are differentiated, there are substantial economies of scale and scope in production, and/or network effects are important. In particular, it might not be right approach for high-technology industries, where firms engage in dynamic competition *for* the market. In these industries, incumbents are primarily constrained by the threat that another firm will come up with a drastic innovation that may make the market tip in its favour.

Our market definition analysis, like those traditionally performed by competition authorities in Europe and the US, focuses on identifying readily available constraints on firms’ price/output decisions. However, this can present a misleading picture of competition in high-tech industries. How should we proceed then? Our proposal is to attribute a lesser role to the market definition exercise in the competitive assessment of these markets. Market shares should not be blindly used as relevant indicators of market power in these industries. Likewise, market share thresholds should not constitute a cornerstone in the analysis of markets, nor on the study (and much less on the regulation) of firms’ behaviour. Last, but not least, supply-side constraints should be carefully considered at the assessment stage.



Most of these recommendations are valid across a wide variety of industries, and not just those that form part of the new economy, but they are likely to be even more relevant in industries where dynamic competition is the norm and where markets tend to be in a constant state of flux.

## 1. INTRODUCTION

Whereas the intuitive idea of a market is commonly used by economists, businessmen and policymakers, the concept of a *relevant market* is not as widely known. This is mainly because it is a rather technical concept whose usage has been traditionally restricted to the narrow confines of competition law and practice. Understanding what a relevant market is and how competition authorities proceed to define it is, however, of fundamental importance for all those interested in competition policy. In particular, it should be a matter of interest for dominant firms that, according to European competition law, have a “special responsibility” towards competition in their relevant markets.<sup>2</sup>

A proper definition of the relevant market is a necessary prerequisite to correctly analyse the impact of mergers and acquisitions on competition. Market definition also plays an important role in the evaluation of the competitive effects of horizontal and vertical agreements. It is also an important step in the assessment of state aids. And it also represents a crucial step in any investigation of abusive conduct. This is true in all jurisdictions, but even more so in Europe. To the extent that dominance is possibly the single most important concept in European competition law, and that market shares are an essential element in the process of establishing the existence of a dominant position, there is no doubt that competition practice in Europe rests heavily on market definition.

Competition law is aimed at protecting and promoting competition. This rather abstract goal is implemented in two complementary ways: first, by preventing the development of anti-competitive market structures through ex-ante (structural) interventions; secondly, by detecting and punishing any restriction to competition or market abuse ex-post. But protecting competition trivially requires establishing the boundaries within which competition takes place---i.e., the relevant market. In order to do this, one must carefully review the various “competitive constraints” that bind together different products as well as firms operating in different locations. These constraints may either stem from the demand-side (*demand-side substitutability*) or the supply-side (*supply-side substitutability*) of the market.

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<sup>2</sup> *Michelin*, Case 322/81 [1983] ECR 3461.

While there is a wide consensus among competition authorities, legal experts and economists about the need to refer to demand-side substitutability for defining relevant markets, the same unanimity does not exist in connection to supply-side substitutability. On the contrary, there seems to be substantial controversy as to the relevance of supply-side constraints for market definition. Competition authorities all over the world tend to attribute a secondary role to supply-side substitutability when defining relevant markets and appear to prefer postponing consideration of supply-side constraints to later stages of the competitive assessment. Some practitioners consider that this state of affairs is not entirely justified from an economic point of view, especially in high-tech industries.<sup>3</sup>

This report considers the appropriate role of supply-side substitutability in the definition of the relevant market, particularly in the context of merger control. In this respect, we shall aim to respond the following questions: Should competition authorities pay attention to supply-side substitutability when defining relevant markets? Should they limit consideration of supply-side substitutability to the calculation of market shares? Or, perhaps, postpone any reference to supply-side substitutability and potential competition to later stages of the competitive analysis? Under which conditions should they do one thing or another? Is there a well-defined legal test (or set of tests) to guide practice on this matter? Are the answers to the previous questions valid for all industries, including so-called new-economy industries?

The remainder of this report is organised as follows.

- Chapter 2 briefly describes the basic concepts of market definition for competition policy purposes. It also explains the different practical nature of market definition exercises in dominance and merger cases, as well as the unavoidable judgemental character of any market definition exercise. The last part of the chapter is devoted to supply-side substitutability and contains the main conceptual contributions of this report. It provides tentative answers to all the aforementioned questions on the

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<sup>3</sup> See, among others, Ira Horowitz, "Market Definition, Market Power, and Potential Competition," *Quarterly Review of Economics and Business*, vol. 22, 1992; Andrew C. Hruska, "A Broad Market Approach to Antitrust Product Market Definition in Innovative Industries," *Yale Law Journal*, vol. 102, 1992; and Herbert Hovenkamp, *Federal Antitrust Policy*, 2<sup>nd</sup> edition, West Group, 1999.

appropriate role of supply-side substitutability in the definition of the relevant market in the context of merger control.

- Chapter 3 first reviews the European Commission's *Notice on the definition of the relevant market*. The goal here is to identify the role attributed to supply-side substitutability in this formal document and, in particular, the criteria established by the Commission regarding its practical applicability for market definition purposes. Then, various merger cases are examined in order to (a) determine what is the Commission's actual practice on market definition, (b) ascertain the internal consistency of the Commission's decision making on supply-side substitutability, and (c) evaluate the consistency between law and practice on this matter. The Chapter concludes with a critical assessment of the Commission's practice.
- Chapter 4 extends the analysis of the previous chapter to other two jurisdictions: the United Kingdom and the United States.
- Chapter 5 considers whether supply-side substitutability should be awarded a greater role in market definition in the so-called new-economy industries. Typical new-economy industries are the computer software and hardware industries, the Internet, the mobile telephony industry, biotechnology as well as other primarily based on the creation of intellectual property and undergoing rapid technological change. In these industries, the market behaviour of incumbents is usually not constrained by readily available demand substitutes, because most often they fail to exist. Instead, the main competitive constraint faced by incumbents comes from new, superior products, whose time of introduction is, however, uncertain.
- Chapter 6 concludes.

## **2. SUPPLY-SIDE SUBSTITUTION IN MERGER CONTROL: MAIN CONCEPTS**

This chapter contains our main conceptual contributions. Section 2.1 briefly describes the basic concepts of market definition for competition policy purposes. Section 2.2 explains the different practical nature of market definition in dominance and merger cases. Section 2.3 then clarifies the unavoidable judgemental character of all market definition exercises. The last part of the chapter (Section 2.4) is devoted to supply-side substitutability. It provides tentative answers to the following questions: Should competition authorities pay attention to supply-side substitutability when defining relevant markets? Should they limit consideration of supply-side substitutability to the calculation of market shares? Under which conditions should they do one thing or another? Is there a well-defined legal test (or set of tests) to guide practice on this matter?

### **2.1. Market Definition in Competition Law**

The concept of a *market* plays a central role in business, economics and public policy. Unfortunately, this concept is not always properly understood and, consequently, markets are often incorrectly defined. Businessmen, for example, tend to define the markets in which they operate in a rather vague, and often very restrictive way.<sup>4</sup> They are likely to circumscribe the relevant market to the set of products that they are currently producing and to those locations where they are currently active. In short, they tend to determine their relevant markets by exclusive reference to their own activities. Sometimes they may even define markets by reference to their actual clients, thus ignoring that they could sell to other clients, who may already patronize competitors. As an illustration, a friend once (incorrectly) described his market as the market for “catering services for hospitals,” because his only clients were precisely hospitals. Some months later, he (again incorrectly) claimed that he was now operating within a larger market because his customer base had expanded to include schools, etc.

In its most common usage, the market is taken to describe a set of products or services that are “somewhat” related. They may be produced using a common technology, or produced

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<sup>4</sup> Maybe except when they discuss the lawyers in order to prepare a notification under the EU Merger Regulation.

by the same firms, or most appropriately, consumers may regard them as substitutes. No matter in which of its different formats, however, this is a fairly imprecise definition.

This should not be all that surprising, however. Indeed, the “intuitive” idea of a market is actually very difficult to define with precision. Fortunately, standard economic analysis provides a well-structured and precise view of what a market is. In economics, a market is defined by a set of primitives: namely, consumer preferences and technology. Consumer preferences are the main driver of demand, whereas supply is largely determined by technological considerations. A market is then defined as a collection of goods and services that are regarded as substitutes by consumers; a set of buyers, whose preferences together with their budget constraints determine their willingness to pay for those products; and a set of sellers, endowed with production technologies whose physical properties determine the minimum price at which they are willing to transfer property of their goods or deliver their services.

For economists, a market is an allocation mechanism that, in the absence of frictions, ensures that goods and services end up in the hands of those who value them most. Markets facilitate exchange and, what is more important, they make it possible that both sellers and buyers *gain* from trading with each other.

Whether or not a market performs efficiently, i.e. it succeeds in allocating the goods/services to those with the highest valuations for them, depends, among other things, on the behaviour of sellers and buyers. For instance, a market may not perform efficiently if there is a seller who can behave to a certain extent independently of its competitors, customers and final consumers. The reason is that, in such case, the seller enjoying a position of dominance may manipulate the market to its own (private) advantage (e.g., by raising prices above incremental costs), but at an aggregate social cost (e.g., those consumers with a willingness to pay just above incremental costs will be left without the good if prices are set above incremental costs, because of market power on the supply side).

The goal of competition policy is thus to ensure that markets work efficiently. But, at least since Adam Smith back in 1776, economists have shown that this goal can only be achieved by protecting competition (which is not the same as protecting competitors, but certainly implies protecting at least consumers.) This, at the very least, requires identifying the existence of dominant positions in the market place, and investigating and deterring abuse

by dominant players. It may also involve ensuring that no dominant position will be created or strengthened artificially, which is precisely the goal of merger control.

But all this obviously requires defining the boundaries within which competition takes place as, in practice, whether a firm enjoys or not a dominant position hinges upon the exact definition of the market over which dominance is being examined. That is, any competition policy investigation requires carefully establishing the limits of the *relevant market*: a market where a hypothetical single seller of a product could exercise market power. Defining the relevant market requires in turn to identify the set of products that compete with each other to satisfy certain customer needs ---the relevant product market--- as well as the locations of the suppliers of these goods ---the relevant geographic market. This enables the identification of the relevant players (buyers and sellers), in order to determine their relative positions in the market place.

At least in theory, the definition of the relevant market is merely a tool for aiding the competitive assessment performed by the enforcement agencies. The objective is to identify those goods and services that provide an effective constraint on the competitive behaviour of the firms supplying the products or services at the centre of the investigation. According to this view, market definition is just a useful intermediate tool for competition policy analysis. It should be an intermediate tool and not a goal in itself because market definition is mostly a static exercise, whereas competition is essentially a dynamic process. This is widely recognised by most competition authorities, independently of the legal setting under which they operate. And it is precisely why dominance should never be established on the sole basis of market share data. Instead, establishing properly a dominant position requires a prospective investigation of the ease of entry.

There are reasons to believe, however, that this is not always the policy followed by competition policy authorities in their daily practice. For instance, market definition has become a central issue in the assessment horizontal and vertical restraints, as market share thresholds determine the type of analysis of individual cases. The *Regulation on vertical agreements and concerted practices* recently published by the European Commission gives firms with market shares below 30% exemptions from Article 81 (subject to some potentially

important exceptions.)<sup>5</sup> <sup>6</sup> Firms with larger market shares do not benefit from this automatic exemption. This obviously makes the market definition exercise an extremely important one. It is no longer just an intermediate tool in the overall assessment of competition. On the contrary, it has a purpose in itself, as its role is extended to determine the *prima facie* legal position of firms. In a relatively narrow market, a successful firm may be regarded as dominant and, as a result, find its behaviour severely constrained, being even unable to match the competitive moves of its main competitors. These constraints would suddenly disappear, however, had the market been defined more broadly. The use of market share thresholds to assess vertical and/or horizontal restrictions of competition or, more generally, to regulate the behaviour of dominant firms raises the profile of the market definition exercise from the status of an instrumental tool to become a central element in the implementation of competition policy.<sup>7</sup>

Therefore, in practice, the scope of the market definition exercise should take into account whether it is just meant to be an intermediate tool for competitive assessment or, instead, it has regulatory implications for the behaviour of firms. For example, when the role attributed to market definition is merely that of an intermediary tool in the assessment of market power, the stage at which entry is considered is largely irrelevant. This is not necessarily true when market share thresholds are used to regulate the behaviour of firms, as we shall discuss in greater detail in the following sections. In the last case, it may be good competition policy to pay greater attention to supply-side responses at the market definition stage. Although, an even better policy would be to avoid making use of market share data for purposes other than the structural analysis of the market; particularly, in those markets where structural indicators of market power are of limited use (e.g., in markets where

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<sup>5</sup> European Commission, "Commission Regulation (EC) No 2790/1999 of 22 December 1999 on the application of Article 81(3) of the Treaty to categories of vertical agreements and concerted practices," *Official Journal*, L 336, December 29<sup>th</sup>, 2001.

<sup>6</sup> See also the European Commission working document on "Proposed New Regulatory Framework for Electronic Communication Networks and Services. Draft Guidelines on Market Analysis and the Calculation of Significant Market Power," COM (2001) 175, March 28<sup>th</sup>, 2001.

<sup>7</sup> It could be legitimately argued that the market share thresholds introduced in the new regulations are supposed to reduce the regulatory burden to those companies which clearly are not in a position to create competition problems, rather than to introduce new constraints to the market behaviour of dominant firms. The latter are free to notify their horizontal and vertical restraints. Furthermore, they will be allowed to go ahead with their plans if, despite having market shares above 30%, entry is found to be timely, likely and sufficient. Therefore, although the market share thresholds have some regulatory implications, these will be more or less stringent depending on (a) the appropriateness of market definition and (b) the actual emphasis paid to the analysis of potential competition.



product differentiation and/or economies of scale and scope and network effects play an important role).

## **2.2. The Uses of Market Definition**

The practical nature of market definition should be a function of the type of case under scrutiny. Most precisely, market definition exercises should differ from merger cases to dominance cases. And they should also be different when the goal is to investigate the competitive nature of horizontal and/or vertical agreements.

In merger cases, “the purpose of the market definition exercise is to identify those products that currently represent the most important competitive constraints on the products of the merging parties.”<sup>8</sup> The relevant legal test in merger cases is whether the merger creates or strengthens a dominant position in the market, taking as a starting point or benchmark the pre-merger situation. Consequently, in merger cases, the market definition exercise focuses on the extent and importance of different competitive constraints at pre-merger prices.<sup>9</sup>

In dominance cases, the focus is not on substitution patterns at current prices. But, instead, the goal is to “identify those products that would represent effective competitive constraints on the products of the allegedly dominant firm at competitive prices.”<sup>10</sup> The analysis, therefore, should seek to elicit substitution patterns at competitive prices. This complicates the market definition exercise tremendously, since it involves performing a complicated, and sometimes almost impossible, counterfactual; at least unless one knows with certainty when prices are set at a competitive level, which is typically not the case.<sup>11</sup> Market definition should thus not be used as anything else but an initial screen in dominance cases.

As we briefly mentioned above, recent developments in the regulation of horizontal and vertical agreements in European competition law have created the need to perform detailed

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<sup>8</sup> Simon Baker and Simon Bishop, “A Guide to the Principles and Practices of Market Definition,” A NERA report for the NMa, January 2000, page 44.

<sup>9</sup> The theoretical underpinnings of market definition do not differ from merger to dominance cases. The differences lie on the appropriate price benchmark, which in merger control is given by pre-merger prices.

<sup>10</sup> Op. Cit., page 44.

<sup>11</sup> If competitive prices were known, then the role of the competition authorities would trivially consist of comparing actual prices to the competitive benchmark.

rule-of-reason (economic) analyses where previously *per se* rules applied. An important part of those analyses is, precisely, the definition of the relevant market and the calculation of market shares. In the case of horizontal agreements between competitors (such as joint venture agreements) the enforcement agencies must trade off any potential efficiency due to the agreement with the increased likelihood of market power originating from horizontal overlaps. The analysis of these agreements has, therefore, much in common with mergers and, consequently, the market definition exercise should be conducted on a similar basis. That is, investigating substitution possibilities at the prices prevailing before the agreement was concluded.

As in dominance cases, however, market definition exercises are much more complicated and necessarily looser when their goal is to assess whether one or various signing parties enjoy a situation of market power before an (horizontal or vertical) agreement is concluded. To the extent that the competitive prices corresponding to the pre-agreement phase remain unknown to the competition authorities, this exercise cannot be based on rigorous quantitative evidence (it may not be available at all) only, but mostly on the sound judgement of the competition officers. This is precisely the kind of market definition exercise required by the new EU regulations on vertical agreements and on collaborative horizontal agreements (such as those aimed at conducting joint R&D projects). One might, therefore, be legitimately suspicious about the effect of these regulations, which hinge upon market share thresholds effectively ignoring that markets may not be defined with precision and, therefore, that market share measures may turn out to be largely biased.<sup>12</sup>

It should be clear at this stage that market definitions are *not* unique. The definition of the relevant market will first depend on the very nature of the case under investigation. The same firm producing the same products may find itself allocated to different *relevant* markets (a) from one merger case to another, if the identity of the merger party has changed or the pre-merger situation has been substantially modified in the interim; and (b) from a merger case to a dominance case, because of the rather different nature of the benchmarks employed. This necessarily implies that the precedent value of previous cases is bound to be

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<sup>12</sup> The similarity with market definition in dominance cases do not relate to the horizontal/vertical nature of the agreement, but rather to the finding that the parties enjoy market power before the agreement is concluded.

limited. Past evidence should not be used in future market definition exercises without the appropriate checks.

In the remainder of this report, we concentrate on market definition in merger control, thus leaving aside the objections raised in connection to dominance cases.

### **2.3. Market Definition: Quantitative Tests v. Informed Judgements**

The relevant market is typically defined as the set of all substitute products and regions that represent a significant competitive constraint on the products of interest. Defining relevant markets, therefore, amounts to identify the various competitive constraints that products, services and regions impose upon one another. The sources of these competitive constraints are three: demand substitutability, supply substitutability and potential competition.

Market definition exercises are most often done according to the following logic. First, the set of products most directly relevant to the case under review (e.g., the products of the merging parties in a merger case) is identified. Then, the authorities consider whether a hypothetical monopolist with control over this (initial) set of products is able permanently and profitably to raise the price of these products by 5-10%, assuming that the prices of all other products remain constant. If the answer is affirmative, then the relevant product market contains that (initial) set of products. Otherwise, new products should be added to the market. The relevant market can be then defined as the smallest set of products that meets the “hypothetical monopolist” test just described.

An important question in connection to this test is whether the relevant product market should only comprise demand substitutes or, instead, it can also include so-called supply-side substitutes. And, if so, when and why? But before moving on to answer those last questions, which will be the subject of the next section, it is important to note that whilst the “hypothetical monopolist” test provides a precise, rigorous and clear-cut theoretical standard to guide a market definition exercise, its exact implementation is typically very difficult.

Strictly speaking, there are few situations where there is sufficient quantitative data to perform the “hypothetical monopolist” test explicitly. This does not mean that the test is not useful. It provides rigorous guidance and it helps to discriminate between alternative

market definitions. However, market definition is ultimately a matter of judgement. And, what is more frustrating, these judgements will almost always be based on incomplete and sometimes contradictory evidence.

The judgemental nature of market definition exercises should be kept in mind when interpreting market share data. By their very nature, market shares are quantitative proxies of the relative competitive positions of rival firms. Yet, one should not forget that these shares are derived only after the relevant market is defined, and that this definition exercise is rarely quantitative. In particular, this consideration should be carefully pondered at the competitive assessment stage. It is not rare to find that a firm is said to hold a dominant position in the market in spite of lots of “soft” evidence on the ease of entry, because this evidence, which necessarily is of a qualitative nature, is considered inferior to the supposedly “hard,” quantitative evidence provided by market shares.

It is precisely because the dichotomy between hard data (market shares) and soft evidence (on the likelihood of entry) is commonly employed in competition policy analyses that many practitioners advocate in favor of market definitions that pay greater attention to supply-side constraints. Of course, a better alternative would be to recognize in practice the qualitative nature of most market definition exercises, as well as of the market shares calculations typically performed by competition authorities.

#### **2.4. The Role of Supply-Side Substitution on Market Definition in Merger Analysis**

Given how relevant markets are typically defined ---i.e., as the set of all those substitute or interchangeable products that provide a significant competitive constraint on the products of interest--- it should be obvious that market definition exercises are mainly about analysing demand substitution constraints.

Demand substitutability refers to the ability of consumers to switch from one product to another in response, *inter alia*, to a change in the relative prices of products. It is obviously the most immediate check on the pricing decisions of firms. A consumer with access to products that she regards as substitutes to those sold by a (dominant) firm can always avoid being abused by switching her consumption in response to any attempt to raise prices.

But even if there are no alternative products to which consumers would consider switching, a firm may still be subject to other rather immediate competitive constraints. Indeed, even if consumers were unable to react immediately to an increase in price, producers might be able to do so rather quickly. How? First, some of them may be endowed with assets (physical and human) that can be easily adjusted to produce substitute goods. If these producers were able to respond to a price increase by switching their production facilities to produce the goods or services subject to such price increase, then consumers would be able to avoid abuse. Second, some other firms might consider entering the market by investing on those assets needed to produce goods that are regarded as substitutes by consumers. This *de novo* entry, however, may help to constrain the behaviour of the established firms as effectively as demand substitution only if entry occurs (or it is likely to occur) promptly.

Supply-side substitution and potential entry can be distinguished along three dimensions. First, by the *length of time* that goes from the price rise to the commencement of supply by the new entrant. Supply-side substitution responds promptly to price increases, while potential entrants may take longer than a year or so to commence supplying the market with their products. Secondly, supply-side substitution involves “uncommitted entry,” i.e. entry at a low cost and without incurring in irreversible investment. Potential entry or “committed entry” refers to entry at a substantial sunk cost.<sup>13</sup> Thirdly, the competitive constraint imposed by supply-side substitutes has a clear-cut significant impact on both pre-entry and post-entry prices. Meanwhile, potential entry is felt via lower post-entry prices only. When entry involves incurring in sizeable sunk costs, entrants do not decide whether to join the market on the basis of current prices but, instead, they focus on the price level that would prevail in the market once entry occurs, which obviously depends on the credibility of retaliation by incumbents and, thus, it ultimately hinges on whether the fundamental/primitive characteristics of the market are likely to support high post-entry prices or not.

In other words, the difference between supply-side substitution (i.e. immediate and costless entry) and other forms of entry is that the producer of a supply-side substitute decides to enter the candidate market in response to an increase in current prices, with no

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<sup>13</sup> The concept of “uncommitted” and “committed” entry was first defined in the US *Horizontal Merger Guidelines*, see section 4.2 below.

consideration of the likely evolution of prices after entry. Supply-side substitution can thus be assimilated to a form of “uncommitted entry”, where entrants profitably exploit any price increase by making their products available in the short-run and leaving the market (without cost) as soon as prices decline. It is in this respect that the constraint imposed by the supply-side substitution on the pricing incentives of incumbent firms is equivalent to that created by readily available demand substitutes. On the contrary, committed entrants will consider the profitability of entry into the candidate market in the knowledge that entry would cause prices to fall. Their decisions will be mainly driven by post-entry prices (rather than current prices) and, hence, their entry will be unlikely to impose a significant constraint in the short term.

While there is little doubt that supply-side responses may often constrain the behaviour of incumbent players, and that they sometimes do so as effectively as demand substitution, it is much less obvious that this observation should lead to broader market definitions. In principle, supply-side considerations could be taken into account for the purposes of merger analysis at three stages: (i) in the definition of the relevant product (or geographic) market, (ii) as part of the identification of market players, once the relevant market has been defined but prior to the calculation of market shares, and (iii) in the assessment of entry, once market shares have been derived.

#### **2.4.1. Market Aggregation**

Option (i) involves aggregating the markets for products that are not seen as interchangeable by consumers.<sup>14</sup> This, in principle, contradicts the definition of the relevant market, which was taken to incorporate demand substitutes only. It also goes against the established principles of economic theory. Yet, there are cases where a strict demand analysis would produce unreasonable results. The obvious example is one in which demand substitution only would lead to define separate markets for size 42 suits and for size 44 suits. It is often argued that in cases like this, supply-side considerations should naturally lead us to define a single, wider market. Products of different sizes or made of different raw

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<sup>14</sup> Or, alternatively, it may involve enlarging the relevant geographic market incorporating those areas where producers of supply-side substitutes are located. In the rest of the document we will concentrate, for expositional simplicity, on the implications of supply-side substitution for the definition of the relevant product market. Our conclusions in this regard extend *mutatis mutandi* to the definition of the relevant geographical market.

materials should be aggregated to form a wider market, not because consumers do see them as interchangeable, but because only by incorporating supply-side considerations into the market definition exercise we can avoid having to deal with an excessively large number of highly fragmented markets, which in any event fail to represent the true “conditions of competition.”

The really difficult issue is how to define precisely when and why we should aggregate markets in response to supply-side arguments. One possible answer can be found in the U.S. DoJ/FTC *Horizontal Merger Guidelines* where it is stated that:<sup>15</sup> “If production substitution among a group of products is *nearly universal* among the firms selling one or more of those products, however, the Agency may use an aggregate description of those markets as a matter of convenience.” (Emphasis added.) This is an approach that, as it will be argued in detail in the next chapter, the European Commission appears to endorse both in theory and practice, and which, in our opinion, provides the correct legal test for market aggregation based on supply-side substitutability.

In what follows, we shall denote this legal test as the “near-universal substitutability” test (or NUS test), because markets will be aggregated *only if* supply-side substitution is “nearly universal.” To implement it, we could proceed in two stages. First, we should determine whether two products are supply-side substitutes. Then, in a second stage, we should investigate whether supply-side substitutability is nearly universal, that is whether production substitution among a group of products is found to be technologically feasible and economically viable for most, if not all, firms selling one or more of those products.

A necessary condition for two products to be considered supply-side substitutes is that the supplier of one of them already owns all the assets needed to produce the other. This applies not only to production assets, but also to marketing assets and to distribution assets, as supply-side substitution will only be effective if producers are able to market their goods, and not only to produce them, in a relatively short period of time. However, possession of all relevant assets is not enough. It is also necessary that redeploying these assets involve *no* additional investments, in particular no sunk costs. Furthermore, producers should not only be (technologically) capable to adjust their production, distribution and marketing facilities

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<sup>15</sup> Department of Justice and Federal Trade Commission, *1992 Horizontal Merger Guidelines*, 1992; footnote 14.

to supply the relevant products with immediacy and at a low cost; they should also find it privately profitable to divert their production, or mobilize their idle capacity, to enter the relevant market. Finally, supply-side substitution will only represent an effective competitive constraint if consumers regard the output of supply-side substitution as a valid demand substitute for the products initially taken to be part of the relevant market.

Supply-side substitution may not always require adjustments in production. It may take place simply by repositioning an existing brand or product through, for example, successful advertising, design changes or revised marketing strategies. Brand repositioning may be indeed a common supply-side response in differentiated product markets. But it does not introduce new elements to the analysis. It will constitute a source of competitive constraint only if it could take place timely and at no sunk cost; if producers of existing brands have the economic incentives to reposition them in response to small price increases; and if consumers regard the repositioned brands as substitutes for those that they had previously patronized.

In sum, the key questions to be answered in order to determine the viability and credibility of supply-side substitutability as an effective competitive constraint are:

(a) What assets are needed to produce the relevant products? In this respect, we shall assess whether:

- The manufacturers of supply-side substitutes possess the required technology, know-how, machinery and facilities.
- They also have access to the appropriate transport infrastructure and distribution channels.
- They possess the relevant marketing assets, such as brand name, and/or the ability to develop those assets within a reasonable period of time. In the case of secondary products, it is important to ascertain whether incumbents may refuse to homologate the components produced by competitors to block their entry.

(b) If any assets are missing, can these be acquired without the need for significant, irreversible new investments, by buying assets that involve no sunk costs or contracting with third parties?



(c) Do manufacturers of supply-side substitutes have the (economic) incentives to engage in production of the relevant goods/services?

(d) Are they able to divert production from supply-side substitutes to the relevant products, or are they contractually tied to continue production of existing products?

(e) Do they possess unused plant capacity that can be brought into production at a reasonable cost?

(f) Will consumers regard their products as valid substitutes for the existing set of products? That is, does the existence of supply-side substitutes influence the market behaviour of dominant firms? Or, in other words, will producers of supply-side substitutes be able to steal sales from incumbents charging excessively high prices? In this last connection, it may be useful to distinguish between situations in which firms compete with products that are currently available from others where they compete by producing to order or on the basis of blue prints. In the last set of cases supply-side substitutability is much more likely to be of importance.

If the answers to these questions, which constitute what we may denote the “supply-side substitution test” (or SSS test), were affirmative, we would conclude that supply-side substitutability effectively constrains the behaviour of incumbents and that it does so as effectively as demand substitution. But, according to our favoured approach, market aggregation requires more than just the existence of a few producers able to adjust their production lines in response to higher prices for the relevant products. The supply-side response should be nearly universal, i.e., it should involve most, if not all, producers. That is, competition authorities should not only identify potential sources of supply-side substitutability but should also convince themselves about their universal character before moving on to aggregate markets for products that are not demand substitutes. This may require investigating whether:

- (i) Most producers are already manufacturing the entire product line.
- (ii) Most existing product lines could be easily adjusted so as to produce the relevant products.
- (iii) Most producers have either enough spare capacity or could divert enough production from other goods to effectively respond to an increase in the prices of relevant products.

- (iv) Most producers have (or are likely to have) similar market positions for the various products that form the resulting (enlarged or aggregated) relevant market. If the positions (market shares) of producers for different products was highly heterogeneous and these differences were not due to chance but, instead, were the result of competitive advantages in some of the product markets, then market aggregation would be a blunt instrument, which would lead to the loss of valuable market information.

These conditions are obviously met when, for example, we consider products that only differ in size, in colour, etc. No shoe manufacturer produces left shoes only. No tailor manufactures size 42 suits only. No car manufacturer produces white cars only. And the list of examples could go on and on. But there are some other valid examples that do not refer to differences in size, in colour or in the raw materials employed in production.

Many of these other examples have to do with companies whose main asset is human capital and who define their businesses in terms of the skills of their employees and not by reference to a pre-specified set of products. These are firms who organize their businesses flexibly to respond to demand pressures, where usually there are few or no dividing lines within the company, and where most of the labour is integrated into a common pool from which resources are drawn to meet clients' needs just in time. This is typically the case of consulting companies and, more generally, of many professional services companies (investment banks, insurance companies, etc.), but also of many (civil) engineering companies.

Indeed, this is an area where supply-side substitutability might prove useful to delineate meaningful markets. For instance, it would not be reasonable to separate a market for advice on investments made on a particular sector of the economy, even though many advisors specialize in a limited number of sectors to a certain extent. The key factor here is that investment advisors generally develop a set of valuation skills that can be easily applied to many different sectors.

Publishing is another sector where supply-side substitution may be extremely valuable. From a strict demand-side viewpoint, few publications could be regarded as interchangeable. A microeconomics textbook is not easily interchangeable with another macroeconomics textbook. This is true everywhere; even at the University of Chicago. A

market definition exercise based on demand-side substitution only would produce many fragmented markets. And, what is more important, it may fail to capture the conditions of competition in this industry.

#### **2.4.2. Market Share Calculations**

Supply-side substitution may impose an effective constraint on the relevant products, even in those circumstances in which it is not nearly universal. All that is needed is that a significant number of firms enter the relevant market promptly in response to a price increase. These firms may already be in possession of the assets required to engage in the production of the relevant goods. Or else, they may have to invest in their acquisition. Of course, in the last case, the extent of entry will depend on the cost of those assets as well as on whether the investment would be irreversible or sunk.

When should these supply-side constraints be taken into account? In the calculation of market shares? Or, later, at the assessment stage? Certainly, as we argued above, they should not lead to wider product and geographic markets, unless substitutability is nearly universal. The answer to the previous questions is that, at least in theory, the stage at which those constraints are considered does not matter, provided that supply-side pressures are *properly* pondered at some stage. Yet, as we explain next, the stage at which they are considered often matters and it may even be of great significance in practice.

In this connection, Bishop and Walker (1999) consider that: “An approach in which supply-side substitution is taken into account at the market definition stage has much to recommend it. First, supply-side considerations can be an important determinant of the elasticity of demand for a product. Secondly, since ease of understanding is important, concluding that a firm with a market share of 70 per cent has no market power is a difficult concept for many to understand. Thirdly, and above all, since supply-side is important, it would force the [competition authorities] to take account of the supply-side in a more systematic manner.”<sup>16</sup> In sum, these authors sustain that supply-side substitution should be explicitly considered at the market definition stage because (a) it may constrain the behaviour of incumbents with effects similar to demand-side substitution, and (b) for practical reasons.

Bishop and Walker rightly emphasise the practical difficulty of overturning market share evidence on the basis of qualitative arguments on the ease of entry. And they may also be right in calling our attention to the need for a more systematic approach to the analysis of supply-side constraints. One might dare to add to these two arguments, a third. Namely, that considering supply-side substitutes in order to identify competitors (once the relevant market has been defined) may be particularly useful in those cases where market share thresholds are, implicitly or explicitly, applied; e.g. in phase I merger cases when the decision to move to phase II is being considered. In those cases where the role attributed to market shares goes beyond that of an intermediary tool for the competitive analysis of the market, more emphasis and greater care should be awarded to the definition of the relevant market and to the calculation of market shares. An approach whereby certain specified behaviour (for example, the adoption of vertical restraints) is prohibited depending exclusively on market share criteria places undue weight on the appropriate definition of the relevant market. In particular, it requires that the correct relevant market can be easily and unambiguously defined.<sup>17</sup> Otherwise, market power may be grossly over-estimated and business freedom incorrectly curtailed.

Not all existing opinions go in the same direction, though. For instance, there are some practitioners who consider that we should avoid condensing into the market definition and market share portion of the analysis the entire competition analysis. This opinion is grounded on the following three observations: First, market definition and market shares provide only an initial and preliminary indicator of the competitive effects of a merger. Secondly, supply-side constraints may be more properly considered at the post market definition competitive assessment of the market. Finally, there are industries (such as new-economy industries) where market definition and market share calculation is of so limited value that they should be seen as redundant. In these cases, the analysis should be conducted, they argue, outside of the framework of market definition.

Supply-side constraints might be better postponed to the competitive stage because of various implementation problems. The first problem of this type is that identifying potential

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<sup>16</sup> Simon Bishop and Mike Walker, *The Economics of EC Competition Law*, London: Sweet and Maxwell, 1999, page 64.

<sup>17</sup> NERA, "EC Vertical Restraints Guidelines: Effects-Based or per se Policy?," *NERA Competition Brief*, No. 13, July 2000, page 3.

entrants is difficult; in particular, when entry is likely to take place with a new technology that is still to be defined and understood precisely. This may explain why competition authorities are more willing to accept inclusion of supply-side substitutes at the market definition and market share calculation stages, but they are much more reluctant to take into account potential entry at these early stages of the competitive assessment.

A second category of implementation problems has to do with *measurement errors*. For instance, it is rather hard to predict accurately what are the production capacities of firms that have not entered the market yet. In those conditions, it is hard to answer rigorously whether supply-side substitution represents a credible competitive constraint. And even much more complicated to ascertain whether supply-side substitutability is nearly universal. However, measurement errors can also occur on the demand side, since it is difficult to predict with confidence whether the products manufactured and marketed by firms producing supply-side substitutes would have any impact on the market. Certainly, this depends on issues such as functional differentiation, advertising and brand image, etc.

Finally, it is also argued that, due to the highly speculative nature of most analyses of entry, promoting consideration of potential entry at the market definition stage would make it easier to accommodate political pressures and it would also make it easier for the competition authorities to act in a highly discretionary way.

### **2.4.3. Concluding Remarks**

Although in theory it may be irrelevant whether supply-side substitution and/or potential competition are considered at the market definition stage, in practice it is not likely to be so, for the reasons explained above. When should supply-side constraints be taken into account? When should we aggregate market on the basis of supply-side considerations? There is no simple answer to any of these two questions. The goal of this chapter is precisely to provide guidance on both matters.

Our preferred approach can be simply described as follows. First, according to standard practice, we consider it appropriate to distinguish between supply-side substitution and potential competition. Supply-side substitutes include firms which are currently producing other products, but which have all the assets needed to produce and market the relevant products, as well as those new entrants that are able to move into the relevant market

rapidly and without incurring significant sunk costs of entry and exit. In our opinion, supply-side substitution should be incorporated either in the identification of market participants in order to calculate market shares, or in the definition of the relevant market. The reason is that it imposes an effective constraint ---similar in its effects to demand-side substitutability--- on the competitive behaviour of the manufacturers of the relevant products.

The second option (i.e., market aggregation) should be exercised only when supply-side substitution is found to be nearly universal, i.e., when production substitution among a group of products is found to be technologically feasible and economically viable for most, if not all, firms selling one or more of those products. Consideration of supply-side substitution at the market definition and market share calculation stage is particularly important when: market share thresholds are employed to regulate the behaviour of firms.

In the absence of market aggregation (i.e., in those cases where supply-side substitutability is not nearly universal), the market shares attributed to producers of supply-side substitutes should be based on the sales or capacity which likely would be devoted to the relevant market in response to an increase in the prices of the relevant products. For this purpose, competition authorities are advised to investigate whether the production capacity of producers of supply-side substitutes is already committed or could be profitably diverted to the relevant market. In many circumstances, however, assessing the quantitative relevance of supply-side substitution may prove too difficult, if not at all impossible. In those cases, calculating market shares for producers of supply-side substitutes may be a highly speculative exercise and, consequently, it may be better to postpone consideration of uncommitted entry to the assessment stage. This move, however, may require reconsidering the excessive weight often attributed to hard evidence on market shares vis-à-vis qualitative data on potential competition.

Potential competition should, in contrast, be considered at the assessment stage in order to determine whether or not entry shall prevent the creation or strengthening of a dominant position in the relevant market.

### 3. SUPPLY-SIDE SUBSTITUTION IN EU COMPETITION LAW

This chapter is organized in three sections. In the first section, we review the Commission's *Notice on the definition of the relevant market*. Our goal here is to identify the role attributed to supply-side substitutability in this formal document and, in particular, the criteria established by the Commission regarding its practical applicability for market definition purposes. In Section 3.2, we proceed to review various merger cases in order to (a) determine what is the Commission's actual practice on market definition, (b) ascertain the internal consistency of the Commission's decision making on supply-side substitutability, and (c) evaluate the consistency between law and practice on this matter. This, of course, is not a comprehensive review of the case law. We selected the cases reviewed in this section, because they illustrated the points that we thought to be more relevant for the purposes of this report.<sup>18</sup> Finally, in Section 3.3, we undertake a critical assessment of the Commission's practice and present the conclusions of this chapter.<sup>19</sup>

#### 3.1. The Commission's *Notice*

In December 1997, the European Commission published its well-known *Notice on the definition of the relevant market for the purposes of Community Competition law*.<sup>20</sup> This notice sets out in some detail the way in which the Commission carries out its analysis of both product and geographic markets. For the European Commission, "the exercise of market definition consists in identifying the effective alternative sources of supply for the customers of the undertakings involved, both in terms of products/services and geographic location of suppliers."<sup>21</sup> The definition of the relevant market is then followed by an analysis of market shares and market concentration. This exercise constitutes a first step in assessing whether a firm enjoys a dominant position, i.e. "a position of economic strength enjoyed by an undertaking which enables it to prevent effective competition being maintained on the

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<sup>18</sup> The author wishes to thank Enterprise DG and Competition DG for providing access to their own internal assessments of these cases, as well as to Florent Prunet and Alexander Lee at Herbert Smith for providing extremely valuable support at this stage of our research.

<sup>19</sup> Of course, our conclusions here are based on the limited case law analysed in this chapter and, hence, they should be taken with caution.

<sup>20</sup> European Commission, "Commission Notice on the definition of the relevant market for the purposes of Community competition law," *Official Journal*, C 372, December 1997.

<sup>21</sup> Commission Notice ¶13.

relevant market by affording it to behave to an appreciable extent independently of its competitors, its customers and ultimately of the consumers.”<sup>22</sup>

According to the *Notice*, the relevant product market “comprises all those products and/or services which are regarded as interchangeable or substitutable by the consumer, by reason of the product’s characteristics, their prices and their intended use.”<sup>23</sup> The relevant geographic market, instead, “comprises the area in which the undertakings concerned are involved in the supply and demand of products and services, in which the conditions of competition are sufficiently homogeneous and which can be distinguished from neighbouring areas because the conditions of competition are appreciably different.”<sup>24</sup> The ultimate goal of defining a market in both its product and geographic dimension is, therefore, “to identify those actual competitors of the undertakings involved that are capable of constraining their behaviour and of preventing them from behaving independently of any effective competitive pressure.”<sup>25</sup>

The Commission considers that the relevant market is mainly shaped by three sources of competitive constraints: demand substitution, supply-side substitution and potential competition. The Commission attributes a very different weight to each of these sources of competitive discipline.

For the Commission, demand substitution takes a leading role in market definition exercises. The *Notice* explicitly states: “demand substitution constitutes the most immediate and effective disciplinary force on the suppliers of a given product, in particular in relationship to their pricing decisions.”<sup>26</sup> The prominent role played by demand substitutability is also clearly stated in the Commission’s definition of a relevant product market (see above), since this is taken to include only those products or services that consumers see as interchangeable or substitutable. The idea is, therefore, to define the relevant product market by reference to all those products that may be used by consumers as substitutes for one another. Again, the purpose of the Commission is to identify market structures where

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<sup>22</sup> *Hoffman-la Roche*, Case 85/76 [1979] ECR 461, 520: 3 CMLR 211, 274.

<sup>23</sup> Commission Notice ¶7.

<sup>24</sup> Commission Notice ¶8.

<sup>25</sup> Commission Notice ¶2.

<sup>26</sup> Commission Notice ¶13.



producers will be able to act independently of any competitive constraint and, in particular, with independence of its customers and final consumers. That is, to identify dominant positions which may be later abused.

The *Notice's* emphasis on demand substitutability appears to be consistent with the Commission's own practice on market definition (before and after the *Notice* was published.) For example, Korah (1997) claims that: "Although, like the Court [of Justice] in *Continental Can*, many economists consider that substitutability on both the demand and supply side of the market define it, some decisions in the European Community adopted in the late 1970s and 1980s used a different test, ... demand substitution alone was used to define the market."<sup>27</sup> Bishop and Walker (1999) also appear to support this view: "When defining the relevant product market, the past practice of the Commission appealed to ... four factors. These relate exclusively to the demand side: (a) physical characteristics of the product/service, (b) intended-end-use, (c) product prices, and (d) consumer preferences."<sup>28</sup> As Bishop and Walker correctly state, these four factors are aimed at proxying the cross-price elasticity of demand, which is the relevant economic concept to determine whether or not, and to what extent, two products are interchangeable from a demand viewpoint.

To underline the importance attributed to demand substitution in EU competition law, it is enough to realize that, according to the Commission's *Notice*, competitive constraints arising from supply substitution will only be taken into account at the market definition stage when their effects can be assimilated to those of demand substitution. In the Commission's own words "supply substitutability may also be taken into account when defining markets in those situations in which its effects are equivalent to those of demand substitution in terms of effectiveness and immediacy. This requires that suppliers be able to switch production to the relevant products [supposedly, the demand substitutes previously identified] and market them in the short term."<sup>29</sup>

As to potential competition, the *Notice* states that "the third source of competitive constraints, potential competition, is not taken into account when defining markets, since the

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<sup>27</sup> Valentine Korah, *EC Competition Law and Practice*, Hart Publishing, 1997, page 80.

<sup>28</sup> Bishop and Walker (1999), pages 57-58.

<sup>29</sup> Commission Notice ¶120.

conditions under which potential competition will actually represent an effective competitive constraint depend on the analysis of specific factors and circumstances related to the conditions of entry.”<sup>30</sup> In other words, potential competition is not taken into account at the market definition stage because its effects are not equivalent to those of demand substitution. The effectiveness of potential competition as a competitive constraint will depend on such things as its likely timing and volume, the degree of product differentiation between old and new products, etc. Potential competition is, in principle, considered “at a subsequent stage, in general once the position of the companies involved in the relevant market has already been ascertained, and such position is indicative of concerns from a competitive point of view.”<sup>31</sup>

### 3.1.1. Supply-Side Substitution

The European Court of Justice clearly established the importance of incorporating supply-side substitutability considerations at the market definition stage in *Continental Can*. The Court rejected the definition held by the Commission in this case on the grounds that the Commission had failed to consider substitutes on the supply-side.<sup>32</sup> The Court reaffirmed its position on this issue in later cases (such as, for example, in *Michelin*<sup>33</sup>). The Commission’s *Notice* took account of the Court’s opinion on this matter and explicitly introduced consideration of supply-side substitutability as part of its approach to market definition.

According to Goyder (1998), the *Notice* appears to regard supply-side substitutability as “a measurement of the degree to which suppliers can switch production to a new product quickly and market it without incurring significant costs or risks, in response to small and permanent changes in the relative prices of existing suppliers.”<sup>34</sup> Roughly speaking, the Commission’s view is that supply substitution constitutes an effective competitive constraint only when firms present in one market are in a position to enter another with immediacy and at low cost. But, as we saw in Chapter 2 above, this in turn depends on whether the firms operating in other markets own (or can readily access to) the assets required to

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<sup>30</sup> Commission Notice ¶24.

<sup>31</sup> Commission Notice ¶24.

<sup>32</sup> *Continental Can*, Case 85/76 [1972] ECR 215; [1973] CMLR 1999; [1972] OJ L 7/25.

<sup>33</sup> *Michelin*, Case 322/81 [1983] ECR 3461.

<sup>34</sup> D. G. Goyder, *EC Competition Law*, Oxford EC Law Library, 1998, page 331.

produce the goods that are subject to a price increase. And also on whether those assets can be effectively redeployed to undertake production of the new good. In particular, if a firm already owns (or can readily access to) all of the assets needed to supply a product that it is not already producing, then it is a source of supply-side substitution that may be incorporated at the market definition stage. Otherwise: “When supply side substitutability would imply the need to adjust significantly existing tangible and intangible assets, additional investments, strategic decisions or time delays, it will not be considered at the market definition stage.”<sup>35</sup>

Therefore, in order to assess the importance of supply substitution as a competitive constraint, we should proceed to answer, among others, the following questions: (a) what assets, including physical production assets (e.g. machinery, factories), distribution assets (e.g. transport infrastructure, retail outlets), and marketing assets (e.g. brand), are needed to produce the relevant product; (b) do other suppliers possess these assets?; and, finally, (c) can these assets be acquired without the need for significant, irreversible new investments? That is, is it feasible to acquire or lease them, so that no sunk costs are incurred?

For the Commission, supply-side substitutability is likely to be of relevance in situations “when companies market a wide range of qualities or grades of one product; even if for a given final customer or group of customers, the different qualities are not substitutable, *the different qualities will be grouped into one product market* provided that *most of the suppliers are able to offer and sell the various qualities* under the conditions of immediacy and absence of significant increase in costs...”<sup>36</sup> (Emphasis added.)

The Commission *Notice* clarifies these circumstances by reference to a practical example. Paper is typically provided in a variety of qualities. Each different quality is produced for a specific use. For example, a high-quality publication cannot make use of a low quality paper, i.e. *the various qualities are not demand substitutes*. However, *most if not all* manufacturers are able to manufacture the different qualities: the necessary adjustments in production can be made at a very low cost and in a very short period of time. In this case, a price increase in the market for high-quality paper would naturally induce low-quality manufacturers to switch

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<sup>35</sup> Commission Notice ¶23.

<sup>36</sup> Commission Notice ¶21.

their production to the high-quality one. This constrains the price decisions taken by high-quality producers and, consequently, *all the different qualities of paper should be considered as part of the same relevant market.*<sup>37</sup>

Therefore, under EU competition law, consideration of supply-side substitutability translates into market aggregation and will therefore lead to wider markets than those that would obtain by considering demand substitution factors only. Yet, aggregating markets for products that are not seen as substitutes by consumers goes against the established principles of economic analysis and may incorrectly enlarge the actual boundaries of the relevant market. It is, perhaps for this reason that the *Notice* seems to require that “most of the suppliers” or “most if not all manufacturers,”<sup>38</sup> be able to produce and market the full range of products in order to enlarge the relevant product market. That is, the Commission appears to require what the US *Horizontal Merger Guidelines*<sup>39</sup> explicitly define as “near universal” substitutability in order to aggregate product markets in response to supply-side substitution reasons. In this sense, US and EU market definition exercises share a common feature: both make use of what in Chapter 2 we denoted as the “near-universal substitutability” test.

The difference between the two approaches lies, as we will see in the next chapter, on the role attributed to supply-side substitution when substitutability is not nearly universal. In this case, according to the *Merger Guidelines*, the US enforcing agencies should explicitly take into account supply-side substitution to identify market participants and calculate market shares. This approach is not followed in the EU. The Commission’s *Notice* makes clear that supply-side substitution only plays a role in the definition of the relevant product and geographic market. If supply-side substitution considerations are not regarded to be sufficiently important so as to widen the relevant market, then the Commission will attribute them no role in the calculation of market shares. The evaluation of their possible impact on competition will be postponed to the analysis of entry.

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<sup>37</sup> Commission Notice ¶22.

<sup>38</sup> Commission Notice ¶¶21 and 22.

<sup>39</sup> Department of Justice and Federal Trade Commission, *1992 Horizontal Merger Guidelines*, 1992, footnote 14.

The problem is that, to the best of our knowledge, the Commission has not stated in any formal document that the test to be applied to aggregate markets because of supply-side substitution is precisely the “near universal” substitutability test, which we have been discussing above. The only reference to this test can be found in an implicit form in the paragraphs from the *Notice* that we have just cited above, which regrettably take the form of examples and/or illustrations. As a result, there appears to be some confusion among practitioners as to the actual role of supply-side substitutability in European competition law.

Indeed, the role attributed to supply-side substitution in the *Notice* has been given a radically different interpretation to that outlined above. Namely, that all that is required to aggregate markets is that supply-side substitution imposes an effective competitive constraint on the behaviour of the parties involved. That is, a constraint with effects similar to those of demand substitution in terms of immediacy and effectiveness. This interpretation finds support in the *Notice’s* second paragraph, where it is said that the purpose of market definition is to identify all those competitors that constrain the behaviour of the parties involved.

Yet, according to the *Notice* and also the Commission’s practice on market definition, it is the products and not the producers of supply-side substitutes which are added to the market definition. Therefore, if markets were aggregated in the absence of near-universal substitutability, the Commission could regularly define excessively large markets and most often underestimate market power. This is why we regard this alternative interpretation as incorrect.

To illustrate this last point, suppose that products A and B are not interchangeable from a demand viewpoint. Suppose further that some, but not a majority, of manufacturers of product B can readily switch production to manufacture product A. If the markets for products A and B were aggregated, the market shares of the manufacturers of product A would be clearly underestimated. This is because by aggregating these two markets, the output of all manufacturers of product B would be taken into consideration for the calculation of market shares, thus ignoring that only some producers of B could switch to produce A.

Yet, if no account was taken of the (limited) supply-side substitution of manufacturers of product B, the market shares of product-A manufacturers would be necessarily overestimated. But this is precisely what could occur if the principles of the Commission's *Notice* were applied, as they restrict consideration of supply-side substitution to situations where it can be shown nearly universal.

To sum up, the Commission's *Notice* identifies three main sources of competitive constraints: demand substitution, supply-side substitutability and potential competition. Of these three, only the first two are taken into account at the market definition stage. The *Notice* attributes a prominent role to demand substitutability in the definition of the relevant product market. This comprises products that are interchangeable from the viewpoint of demand/consumers. Supply-side substitution is also taken into consideration in the *Notice*, but only to the extent that its effects are equivalent to those of demand substitutability and only for market aggregation purposes. In this respect, the *Notice* appears to support a version of the "near-universal substitutability test" described in Chapter 2. The next section reviews some cases where supply-side substitution has been explicitly considered in order to determine whether the approach outlined in the Commission's *Notice* and described above is followed in practice.

### **3.2. Case Law**

In this section we proceed to analyse how supply-side substitutability has been handled by the European Commission in various merger decisions. Our goal is to identify the approach followed by the Commission in practice, in order to ascertain (a) its consistency from case to case, and (b) its consistency with the principles included in the *Notice*. Point (a) will help us understand the value of precedent in market definition exercises conducted by the European Commission, whilst point (b) will also allow us to determine the practical relevance of the *Notice*.

### 3.2.1. **Aerospatiale-Alenia/de Havilland (1991)**

This case concerned the joint acquisition by Aerospatiale and Alenia-Aeritalia e Selenia (Alenia) of de Havilland, a company owned by Boeing.<sup>40</sup> Aerospatiale and Alenia jointly own Avions de Transport Regional (ATR), which was set up in order to design, develop, manufacture and sell regional transport aircraft. de Havilland manufactured regional turbo-propeller aircraft. The relevant product market was defined by the Commission as the market for regional commuter aircraft, i.e., turbo propeller aircraft of between 20 and 70 seats intended for regional carriers. Jets were not included in this market because they are considerably more expensive to buy and operate and are therefore intended for longer distances. The market for turbo propeller aircraft was further subdivided into three different sub-markets (20-39 seats, 40-59 seats, and more than 60 seats), because of lack of demand substitution.

The operation was considered incompatible with the common market, because it would create a dominant position in the relevant product markets. This conclusion was based on the following observations: (a) the merger gave the new entity a market share worldwide of 64% in the 40-59 seats sub-market and 76% in the more-than-60 seats market segment; (b) competitors were considered weaker because, among other things, they would not have a full range of products; (c) customers had limited bargaining ability; and (d) entry was deemed unlikely.

As to possible supply-side substitution between market segments, the Commission considered that in the medium term there might be some possibility for commuter manufacturers to modify existing types, so as to develop a new competing product in one of the other segments. The Commission referred to a study carried out by the parties stating that it would take considerable time (longer than three or four years) for the manufacturers to switch their facilities to produce a modified type. This evidence was taken to suggest that there was no reason to modify the market definition conducted on the basis of demand substitution.

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<sup>40</sup> *Aerospatiale-Alenia/de Havilland*, Case IV/M. 053 [1992] 4 C.M.L.R. M2; [1991] O.J. C334/42.

Yet, in the particular context of this market it may be unclear whether three or four years is a considerable time length or not. It is widely agreed that the future competitive position of a manufacturer on the aircraft industry must be measured on the basis of its share of the orders placed but not yet delivered. Market share data on current deliveries and/or the stock of planes of former generations are irrelevant for this purpose. But the time elapsed between the placement of an order and delivery may well be long. Indeed, carriers have all the incentives to plan ahead to ensure that there is enough competition (both actual and potential) on the supply side.

Hence, in this market, it may be unreasonable to exclude the possibility of supply-side substitution because of the long time needed to develop a new plane, since manufacturers may compete today to produce planes that will have to be delivered at that point in the future or even later. In other words, switching production facility may take time and, nonetheless, the effects of supply-side substitutability may be felt with immediacy. This is generally the case when contracts signed today are for effective deliveries in a number of years exceeding those required to switch production.

Another issue is to what extent would producers be willing to extend their product ranges to encompass new varieties. And whether a sufficient number of them would have the economic incentives to lengthen their product lines so as to justify aggregating the different market segments into one.

This can illustrate the difficulties of identifying supply-side substitutes in actual competition cases. A mechanic application of the criteria often employed to distinguish between supply-side substitution and potential entry (i.e., whether entry takes place in less than a year) led the Commission to conclude incorrectly that no competitive constraint stemming from the supply-side would produce effects similar to demand substitution in terms of immediacy.<sup>41</sup>

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<sup>41</sup> Furthermore, even if supply-side substitutability argument might have justified defining a wider relevant market ("the market for turbo propeller aircraft"), this does not necessarily imply that the merger would have been cleared as such. In particular, to the extent that the offers of the merging parties impose an effective competitive constraint on each other, the Commission might have legitimately remain concerned.



### 3.2.2. Mercedes-Benz/Kässbohrer (1995)

This case concerned the acquisition of Kässbohrer, a producer of buses, coaches and specialized commercial vehicles, by Mercedes-Benz, a subsidiary of Daimler-Benz (now Daimler-Chrysler), which manufactured cars, trucks, buses and vehicle components.<sup>42</sup> The Commission accepted that this transaction did not create or strengthen a dominant position and, consequently, it declared the transaction compatible with the common market.

Although the merged entity would hold significantly large market shares in each of the relevant markets, “the existing competition from German suppliers and especially the potential competition from foreign suppliers will ensure that Mercedes-Benz/Kässbohrer will not be in the position to act independently of its competitors and customers to any substantial extent.”<sup>43</sup> The Commission found no significant barriers to entry into the relevant markets. The cost of establishing a service network was considered to be low. Also switching costs were regarded to be rather low as, among other things, buyers acquired buses from different manufacturers and operated mixed fleets. For these reasons, potential competition was thought of as an important and effective competitive constraint.

Supply-side substitutability between different types of buses was also considered at length and it was found to be important. Yet, this finding had a very limited impact on the Commission’s definition of the relevant product market. The Commission identified three distinct relevant product markets: the market for city buses, for intercity buses and for touring coaches. City buses are designed for public transport in urban areas and are typically low-floor buses to facilitate entry and exit. Intercity buses are designed and used for public transport in rural districts and public intercity travel. Finally, touring coaches are aimed at the leisure market and, in particular, at the long-distance tourist travel market. They tend to be rather comfortable and luxurious.

This distinction was established on the basis of demand-substitution criteria. The Commission understood that buses are designed for specific types of travel service. “City buses are, for example, designed for a type of travel where people typically spend ... only a short time on the bus and where easy entry and exit are important. Touring coaches ... are

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<sup>42</sup> *Mercedes-Benz/Kässbohrer*, Case IV/M. 477 [1995] O.J. L211/1.

<sup>43</sup> *Mercedes-Benz/Kässbohrer*, ¶ 106.

designed for transporting people over long distances, where people spend hours or even days in the vehicle. The design of touring coaches emphasises comfort and storage space rather than ease of entry and exit.”<sup>44</sup> The bus market was split into these three different market segments, despite mounting evidence about increased demand substitutability and supply-side substitutability. The Commission found that “despite being allocated to a specific market segment, buses can increasingly be used for different purposes.”<sup>45</sup> Indeed, a large number of bus companies surveyed by the Commission used the same buses for both scheduled services and for touring and excursions.

The Commission also found evidence of considerable supply-side substitution in bus production. First, it was noted that intercity buses are “derived partly from city buses and partly from touring coaches,” which implies that “entry barriers to the intercity bus market for a producer of either city buses or touring coaches are ... very low.”<sup>46</sup> Furthermore, the Commission recognized that “the different types of bus can normally be produced in the same plant with the same machines, and there are many common components between them.”<sup>47</sup> The Commission went further and identified the main source of supply-substitution: “Provided a supplier produces different types of bus, switching production from one type of bus to another is ... not particularly difficult, and most of the big producers ... have a full product range.”<sup>48</sup> Therefore, supply-side substitution was likely to be easy (at least for technological reasons, as no economic analysis was conducted.)

And yet, despite the abovementioned demand-substitution and supply-side substitution observations, the Commission decided not to define a single relevant market for all buses, since “there would always be quite considerable substitution gaps within such an overall market.”<sup>49</sup> This is certainly a meagre explanation. It suggests that the Commission decided to segment the market, because a number of customers could not be able to substitute across different types of bus. But it is a well-known principle that demand substitution should be considered *at the margin*, rather than focus on the average or typical consumer. Furthermore,

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<sup>44</sup> *Mercedes-Benz/Kässbohrer*, ¶ 9.

<sup>45</sup> *Mercedes-Benz/Kässbohrer*, ¶ 20.

<sup>46</sup> *Mercedes-Benz/Kässbohrer*, ¶ 21.

<sup>47</sup> *Mercedes-Benz/Kässbohrer*, ¶ 21.

<sup>48</sup> *Mercedes-Benz/Kässbohrer*, ¶ 21.

<sup>49</sup> *Mercedes-Benz/Kässbohrer*, ¶ 22.

even if the constraint imposed by demand-side substitutability was found to be weak and insufficient, the Commission appears to have established that supply-side substitutability was indeed nearly universal. This should have led the Commission to aggregate the markets for different types of bus into a single market. In conclusion, the Commission appears to have acted against the principles established in its *Notice* on this particular case.

### 3.2.3. Ciba–Geigy/Sandoz (1996)

The case concerned a merger between Ciba–Geigy (Ciba) and Sandoz to form a new company, Novartis.<sup>50</sup> Ciba and Sandoz had partly overlapping business activities in health-care products, crop-protection products, animal health protection products and seeds. The merger was declared compatible with the common market subject to the licensing in a fair and non-discriminatory basis of some active ingredients of Methoprene, an animal health product.

Supply-side substitution did not play any appreciable role in this case. By and large, the relevant product markets were narrowly defined in terms of intended use (i.e., the kind of disease that had to be treated.) Yet, the Commission considered in great detail the possibility of potential entry. In fact, the ease of entry in some market segments led the Commission to conclude that there was no creation or strengthening of a dominant position, despite the large market shares of the merging parties.

This was, for example, the case in the market for health care products, which can be further subdivided in medicinal products, active substances and future markets. In the case of medicinal products, the Commission considered that potential entry by generics manufacturers could exercise a significant discipline on the merging parties.

The disciplinary role of generics manufacturers or any other potential entrant in the pharmaceutical industry is bound to be greater than in most other economic activities. This is due to the particular cost structure of pharmaceutical firms. They face very high fixed costs (typically associated with substantial R&D expenditures) and low, or negligible, incremental costs. Because of low incremental costs, manufacturers can easily expand their output at almost no cost in response to a small price increase. Because of this reason, in the

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<sup>50</sup> *Ciba–Geigy/Sandoz*, Case IV/M. 737 [1996] O.J. L201/1.

absence of regulatory barriers, generics represent a formidable entry threat to medicinal products after their patents expire.

The Commission showed greater concern for the effects of the merger on the degree of competition in some future health care product markets. Indeed it stated that: “It cannot therefore ultimately be said with sufficient probability that the merger will on any future market lead to the creation or strengthening of a dominant position.”<sup>51</sup> The Commission was particularly concerned about whether the combination of the patent rights held by Ciba and Sandoz could block the development of gene therapies for the treatment of tumours, as the parties were the only drug manufacturers that were advanced in this research field. The Commission’s concerns on this matter were solved when Novartis submitted undertakings offering to license the relevant patents on a non-exclusive basis.

In connection to the markets for crop protection products, the conclusion of the analysis of the fungicides, herbicides and insecticides markets was that the “concentration does not create or strengthen a dominant position as a result of which effective competition could be significantly impeded in the common market or a substantial part of it.”<sup>52</sup> This conclusion was reached in spite of the large market shares held by the merging parties and their relative prominent position regarding R&D for these types of products. The Commission based its decision on the following observations:

- Market shares were not stable over time.
- The merging parties faced a large number of competitors in the markets concerned.
- Competitors had access to substantial R&D capacities.
- Generics exerted discipline on pricing decisions.
- Buyers (cooperatives and wholesalers) enjoyed substantial (countervailing) power.

The Commission also considered the impact of potential entry in the markets for animal health products. These include a large number of drugs among which the most interesting for our purposes are the market for stable-fly control and the market for small active

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<sup>51</sup> *Ciba-Geigy/Sandoz*, ¶ 106.

<sup>52</sup> *Ciba-Geigy/Sandoz*, ¶ 176.

ectoparasiticides (SAE). The Commission concluded that the merger did not raise competitive concerns in the first of these two markets for the same sorts of reasons employed in their analysis of crop protection products. On the contrary, the Commission thought that in the SAE market “it is sufficiently probable that Novartis will not be adequately constrained by competitors in the future. The merger will therefore create a dominant position in this market.”<sup>53</sup> The following factors led the Commission to reach this conclusion:

- The parties had a strong position in the market (above 50% compared to 10-20% and under 10% of the strongest competitors.)
- The parties were supplying their competitors’ active ingredients necessary to manufacture SAEs. Any other source of supply was unlikely.
- The parties were the owners of the only on-animal IGR (stands for insect growth regulator) existing in the market place. This product was expected to become the market leader.
- The merger implied the loss of a potential competitor for the development of on-animal IGR (Sandoz was currently Ciba’s best placed competitor in the race for on-animal IGRs.)
- The parties controlled three out of five active ingredients necessary for the development of on-animal IGRs, and generics manufacturers lacked the know-how necessary to manufacture them. In addition to the lack of availability of ingredients, it would take 4-5 years to develop a new on-animal IGR.

The Commission carefully looked at potential competition in each of the relevant product markets, which were defined on demand substitution grounds. This analysis led the Commission to consider that the merger had no impact on competition in some markets, despite high post-merger market shares. Market share evidence was studied but did not determine the Commission’s position with respect to the competitive impact of the merger in each of the different markets. Another positive feature of this decision relates to the emphasis placed on R&D considerations. When the merger was thought to foreclose R&D,

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<sup>53</sup> *Ciba-Geigy/Sandoz*, ¶ 274.

such as in the SAE market, then it was considered anti-competitive and undertakings were requested. Otherwise, when there were various competitors with significant R&D portfolios, a more lenient attitude was adopted. The presence of competitors with strong R&D capabilities was understood as a major source of competitive discipline. In these last cases, the merger was declared compatible in spite of large market shares.

Because of all this, the fact that supply-side substitutability was not explicitly analysed at the market definition stage is of minor importance. In the words of Valentine Korah:<sup>54</sup> “It does not matter at which stage the assessment of entry takes place, as long as it is not neglected. Nevertheless, there seems to be little point in defining a market if products that are excluded from the definition become relevant later.”

### 3.2.4. DuPont/ICI (1997)

The case concerned, *inter alia*, the acquisition of ICI's titanium dioxide (TiO<sub>2</sub>) business in Western Europe.<sup>55</sup> TiO<sub>2</sub> is produced in a number of grades that, however, generally have the same basic properties. Grades are differentiated by certain technical characteristics and by intended use, although, there is no straight relationship between TiO<sub>2</sub> grades and end use, since the same grade can be used for several applications. Demand-switching conditions are, however, difficult because, for various technical reasons, most customers find it difficult to substitute grades and/or switch suppliers over the medium term. That is, while in principle consumers may regard different TiO<sub>2</sub> grades as interchangeable *ex ante*, these products become differentiated *ex post* due to consumer switching costs. Notwithstanding this lack of substitutability on the demand side, a single market for all the titanium dioxide grades was defined, except in regard to sulphate TiO<sub>2</sub> grades. The Commission left open the question whether sulphate grades amount to a separate market, as in any case DuPont did not produce these products. The acquisition was cleared in phase I without further investigation.

Supply-side substitution arguments played a central role in this case. DuPont alleged and the Commission concurred that there was a single market for all the TiO<sub>2</sub> grades because: (a) switching production from one grade to another was easy and took only a few hours, (b) all suppliers active in Western Europe offered or could offer a full range of grades, and (c) prices for most TiO<sub>2</sub> grades were similar.

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<sup>54</sup> Korah (1997), page 81.

<sup>55</sup> *DuPont/ICI*, Case IV/M. 984 [1998] O.J. C004.

The Commission sought confirmation of DuPont's views from its competitors. Three of them gave answers in line with DuPont's. Another three advocated for narrower markets. The questionnaire sent to competitors asked them to state their own views on the relevant product market. It might have been preferable, however, to ask them instead about factual evidence on both technical and marketing issues. First, competitors might have found it easier to report factual evidence than defining relevant markets for merger control purposes. Second, their responses to factual questions might have been much more credible and informative. And, therefore, they might have led to a more informed and better grounded market definition.

DuPont claimed that all major suppliers offered or could offer a full range of products, and that switching production from one grade to another was easy and could be done within very short time. In other words, DuPont asserted that it was technologically feasible to switch production from one grade to another and that existing suppliers had the ability to do so. Indeed, all of them were reported to produce the entire range of grades.

This is a fine argument indeed. It suggests that supply-side substitutability was near universal and, thus, it constitutes solid evidence in support of market aggregation. Yet, the Commission should have investigated this issue further, since technological feasibility is a necessary but not sufficient condition for supply-side substitutability. Did producers have the economic incentives to switch production from one grade to another with immediacy? It is hard to know with certainty given the information at hand, but there may be reasons to doubt it. Notice that increasing the production of any given grade in response to a price increase may have been difficult, given that producers usually had their capacities committed via long-term contracts signed with customers. The latter demanded contracts of such duration because "final product's specific coating characteristics must be kept until this final product be replaced by a new one or ceases its technical life."<sup>56</sup> In these circumstances, it may have been largely impossible or, at least, very costly to re-deploy capacity from one grade to another. And if this was the case, then supply-side substitution was just a mere technological possibility that should have been underplayed in the market definition exercise.

Supply-side substitutability must be economically viable and not only technologically feasible if it is to play a role in market definition. The Commission should investigate whether most competitors have *both* the technical ability and the economic incentives to adjust their production mix in response to a price increase. The composition of the competitors' product lines pre merger provides useful information, but it is not conclusive evidence of supply-side substitutability.

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<sup>56</sup> *DuPont/ICI*, ¶ 38.

### 3.2.5. Agfa-Gevaert/Du Pont (1998)

The case concerned the acquisition of DuPont's worldwide graphic arts film and offset printing plates business by Agfa.<sup>57</sup> The Commission distinguished various different product markets: the markets for graphic arts films, for offset printing plates, and for equipment, chemicals and servicing. The Commission concluded that the notified operation would create a dominant position on the EEA market for negative printing plates. On the other markets, it found no problems. The parties submitted an undertaking resolving the Commission's concerns in the market for negative printing plates.

Supply-side substitution was discussed at length at the market definition stage. But this discussion was not based on a careful investigation of the relevant arguments. Competitors were not asked for their views on the likelihood of supply-side substitution in these markets. As in the previous case, instead, they were asked directly about the broader issue of the actual scope of the relevant product market.

In its decision, the Commission considered that, although the production of different types of plates might involve the use of the same product lines, different product markets existed for positive and negative plates since:

- (a) Only some producers actually manufactured both types of plates.
- (b) Not all the installed production lines could produce both kinds of plates.
- (c) The adjustment required in machinery was costly.
- (d) The distribution channels as well as the users were very different for both kinds of plates.
- (e) There were significant differences in their prices.

In our opinion, these arguments are not convincing enough to disregard the possibility of supply-side substitution. As in DuPont/ICI, the Commission's analysis was unsatisfactory and for similar reasons. None of the abovementioned reasons is grounded on an appropriate

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<sup>57</sup> *Agfa-Gevaert/DuPont*, Case IV/M. 986 [1998] O.J. L211/22.



analysis of the competitors' economic incentives to switch production from negative to positive plates and vice versa. Nor was it properly investigated if the new varieties could be marketed at a reasonable cost. Roughly speaking, the Commission focused on whether competitors were offering all different types of plates at the time the concentration was announced. But this is not the appropriate question. Instead, the Commission should have investigated whether producers could have adapted their offerings in response to the acquisition or, more precisely, in response to a "small but significant non-transitory" price increase by Agfa.

Information on the composition of the competitors' product lines prior to the concentration is certainly useful to determine the producers' ability to switch production towards the relevant products. It may also help to conclude whether, at pre-merger prices, the various product varieties were indeed considered relevant alternatives from the viewpoint of suppliers. But it tells us very little about the response of the same suppliers to higher prices *ex post*.

Let us consider each of the arguments in turn. First, the Commission found evidence that only some producers manufactured both types of plates. But even if not all producers actually manufactured both types of plates, it is perfectly possible that most of them could do it in response to a significant and non-transitory price increase. That is what should have been considered in order to determine whether market aggregation was justified because of supply-side substitutability under the "near-universal" substitutability test, which is implicitly established in the Commission's *Notice*.

Second, the Commission's observations on the size of the adjustment costs in machinery or on the costs of deploying new distribution channels just show that supply substitution was not without costs. But they do not allow us to discard those sources of competitive constraint in the case at hand. These costs should be traded off with the benefits expected upon entry, which may be particularly large in markets like these, where there appears to be some degree of vertical differentiation.

Finally, in markets where products are vertically or horizontally differentiated, the law of one price does not need to apply. In vertically differentiated markets, price differences just reflect intrinsic quality differences (as well as the willingness to pay for either quality of consumers.) Likewise, in horizontally differentiated markets, prices are given by the

distribution of consumers' preferences and the actual degree of product differentiation. Yet, in both kinds of markets, "marginal" consumers react to price changes by switching across the product variety space. And producers may also react to these price changes by switching production from one set of products to another. But supply-side substitution will not necessarily lead to price equalization, because these price differences originate on preferences.

The Commission's decision concluded that "taking into account all the above characteristics, the Commission considers that in addition to arguments relating to the absence of demand-side substitutability, the lack of immediate supply-side substitutability confirms that distinct product markets exist for positive, negative, CtP and electrostatic offset printing plates."<sup>58</sup> It was later concluded that the operation gave rise to a dominant position on the market for negative printing plates. This conclusion was reached based on market share data (which may have been misleading given previous criticisms on market definition), but also after a careful analysis of potential competition. In this analysis, "regard was had, first to the level of competition potentially being exercised by producers already having a market presence and who could develop additional capacity, and, secondly, to the possible entry of new competitors on the EEA market."<sup>59</sup>

The Commission considered that no entry could be expected from existing competitors. First, the Commission found that competitors had reached a high level of capacity utilization ---while Agfa and DuPont had not. In addition, the opportunity cost of diverting capacity to the negative plates market was very high, as these competitors were allegedly serving more profitable markets: "It is noticed that plates for CtP is a rapidly growing market where margins are higher than in markets for negative plates."<sup>60</sup> Competitors did not have plans at the time of the merger to expand capacity. And even if they did, marketing this type of plates would be both difficult and costly because of large consumer switching costs.

These considerations show indeed that immediate entry by competitors in the market for negative plates was most unlikely. There was no excess capacity, and diverting capacity was

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<sup>58</sup> *Agfa-Gevaert/DuPont*, ¶ 31.

<sup>59</sup> *Agfa-Gevaert/DuPont*, ¶ 57.

<sup>60</sup> *Agfa-Gevaert/DuPont*, ¶ 59.

costly and possibly ineffective from the standpoint of competition. But it is unclear whether entry in a longer time period, for instance in response to higher post-merger prices, would have been possible. Given the emphasis on the short term, this leg of the Commission's analysis may have been conducted at the market definition stage, as part of the study of supply-side substitution, although it is unlikely that it would have led to a different market definition.

The Commission also considered potential entry by new competitors. It again concluded that this was most unlikely. This time, however, it appears to have adopted a more appropriate time frame. Entry in a foreseeable future was considered unlikely because: (a) it required significant capital investments; (b) entry was feasible only if a full range of products (films, plates, equipment, chemicals and services) was provided, due to significant one-stop-shopping economies; (c) stealing business from incumbents would involve significant efforts, because of high consumer switching costs; (d) entrants would also face problems because of the exclusivity arrangements between incumbents and original equipment manufacturers and because of exclusive distribution arrangements with dealers.

In conclusion, in the two last cases being analysed (which were notified before the *Notice* was published), the Commission seriously considered the possibility of supply-side substitution at the market definition stage. In both cases, it focused on whether substitution was feasible from a technological perspective, and it took as a proxy for that whether suppliers offered a full range of products prior to the merger. No explicit attention appears to have been paid to the economic incentives of existing or potential competitors. When the existence of excess capacity and/or divertible production was considered, it was not as part of the market definition exercise but at a later stage. It is unclear whether the analysis of supply-side substitution was aimed at identifying the possibility of 'hit-and-run' entry or, instead, it tried to establish whether substitutability was nearly universal. Sometimes, it appears as if it was focusing on the latter (in accordance with the criteria that were later established in the Commission's *Notice*), because of its emphasis on the ability of most suppliers to switch production.

### 3.2.6. Airtours/First Choice (1999)

In this decision it was declared that Airtours' proposed takeover of First Choice was incompatible with the common market.<sup>61</sup> The Commission found that the merger would "lead to the creation of a dominant market position in short-haul package holidays in the United Kingdom on the part, collectively, of Airtours/First Choice and the two other leading tour operators."<sup>62</sup>

The discussion on supply-side substitution was focused on whether a company operating long-haul flights could switch to short-haul flights without incurring in significant additional investments. The conclusion was that, as aircraft used in long- and short-haul flights are not interchangeable and the cost of aircraft is relatively high, these two types of flights belonged to two different product markets.

Although it is certainly true that it is technically optimal to use different types of aircraft for flights of different time duration (i.e., flying to different destinations), it is less clear why it would be economically unjustified to use, albeit inefficiently, aircraft of a particular type for an alternative use in response to a price increase. This is a quantitative question that requires an economic inquiry of the costs and benefits of such move. And, in particular, a more detailed analysis of the costs of leasing aircraft, of existing capacity, etc. The Commission may have been right in separating these two markets for purely technological reasons, but it appears to have failed to undertake the relevant economic analysis to draw such conclusion.

The analysis of supply-side constraints at the assessment stage was not without problems either. The Commission concluded that entry barriers were high, but this conclusion was based on a rather biased analysis of the existing evidence.

Tour operators group different services -transport, lodging and some other services, such as car rentals- to form product packages. Some tour operators are vertically integrated owning both airlines and/or travel agencies. The Commission considered that vertical integration provided large operators a substantial competitive advantage in the marketplace. So large indeed, that it could even constitute *de facto* an effective barrier to entry. The Commission

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<sup>61</sup> *Airtours/First Choice*, Case IV/M. 1524 [1999] O.J. L 093.

<sup>62</sup> *Airtours/First Choice*, ¶ 51.

further considered that existing tour operators and potential entrants would not be able to expand their capacity in response to a reduction in the capacity of the dominant players because:

- Vertical integration moves followed by main operators had reduced the availability of airline seats, and the merger would constrain the supply still more. Furthermore, the option to become vertically integrated was not really opened to small operators: “A small operator [...] will not generate sufficient tour operation business to justify owning (or leasing) a viably-sized aircraft fleet [as] [s]ome 80% of the total costs of airline operation are scale-related. [T]he possession by the large incumbents, through their in-house airlines, of a stock of good-quality slots at Gatwick, in particular, gives them an advantage which smaller, non-integrated competitors cannot hope to replicate.”<sup>63</sup>
- Vertical integration had also made it more difficult for independent tour operators to access distribution through travel agencies. The inferior quality of independent travel agencies made alternative sources of supply and distribution not likely.

This conclusion is rather surprising. History suggests that this is an industry in which the small can compete on an equal footing with the big, and in which the fortunes of the individual players rise and fall.<sup>64</sup> Indeed, the history of the industry indicates a market where there is huge variability in supplier shares. A 1997 inquiry into the foreign package holidays by the UK Monopolies and Mergers Commission (MMC) concluded that: “Players come and go. There are no significant barriers to entering either the tour operator or the travel agent market.”<sup>65</sup> It is also an industry where significant players have left the market while other initially rather small companies have successfully entered the market. First Choice grew from 4% of the market in 1992 to 15% at the time the merger was notified. First Choice became vertically integrated when it was relatively small, which casts doubt on the Commission’s opinion that a minimal sales volume and financial muscle is required to own a charter airline or to lease aircraft on reasonable terms.

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<sup>63</sup> *Airtours/First Choice*, ¶ 117.

<sup>64</sup> NERA, “When three is not enough? The Airtours/First Choice Decision,” *NERA Competition Brief*, No 8, September 1999.

Furthermore, the Commission limited its analysis of potential entrants too much, by focusing on the entry of small tour operators, which allegedly should have to integrate upstream to compete effectively. Something that, the Commission argued, might have been too expensive for them to do. But what about the entry in the tour operator market of airlines that integrate downstream by creating or acquiring tour operators and travel agencies? This is precisely what Iberia, the Spanish carrier, did a few years ago. Iberia now owns a charter airline, Viva Tours, a tour operator, Mundicolor, and has its own network of travel agencies all throughout Spain. And this is not the only instance of this sort of strategy in the world.

Finally, the Commission ignored a substantial entry threat: distribution via the Internet. We see every other day how the Internet is becoming a major route to market package holidays. Web sites such as Travelocity, Yahoo Travel, etc. are already very popular and may seriously undermine any control that tour operators owning retail travel agents might allegedly may had.

These omissions are of great importance as entry barriers played a prominent role in the case. The case was found incompatible with the common market because the merger was thought to give rise to a joint dominant position in the market. The outcome might have been different, had the Commission recognized that barriers to entry were low or inexistent, since in an industry with low entry barriers to entry and mobility, concerns about collective dominance are typically out of place.

### **3.2.7. Volvo/Scania (2000)**

The proposed concentration involved the acquisition by Volvo of a controlling stake in Scania.<sup>66</sup> Both Swedish companies are active in the manufacture and sale of trucks, buses and marine and industrial engines. The Commission blocked the merger as it concluded that it would create dominant position in the market for heavy trucks in Sweden, Norway, Finland and Ireland, for touring coaches in Finland and the United Kingdom, for intercity buses in Sweden, Finland, Norway and Denmark and for city buses in Sweden, Finland, Norway, Denmark and Ireland.

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<sup>65</sup> Monopolies and Mergers Commission, *Foreign Package Holidays*, December 1997, ¶ 1.6.

The Commission analysed the truck and bus markets separately. Within the truck market, it distinguished two different relevant markets: the market for heavy trucks (over 16 tons) and the market for trucks below 16 tons. This distinction was grounded on both demand and supply substitution arguments. Thus, for instance, it was said that “different production lines are used to produce trucks belonging to different categories and that manufacturers can concentrate their production on one range with no presence or with a relatively weaker presence in another range.”<sup>67</sup> While this is a relevant supply-side consideration, it again shows the Commission’s emphasis on pre-merger conditions and on technological considerations. Indeed, the decision does not clarify whether manufacturers of trucks below 16 tons were capable of, and could have had the incentives to, switch production to the over 16 tons market segment if the prices of the latter type of trucks had raised 5-10%. This question cannot be satisfactorily answered by exclusive reference to pre-merger conditions and technological considerations.

The Commission defined a single relevant market for all heavy trucks despite there were several different types, which were not fully interchangeable. For example, one could distinguish between rigid trucks and tractor heavy trucks. There is substantial evidence that these two types are not seen as substitutes by customers. In spite of this, the Commission aggregated them within a single relevant market using supply-side substitution criteria. To justify this decision, the Commission emphasised the fact that “any major European truck manufacturer is in a position to offer a complete range of different types of heavy trucks.”<sup>68</sup> This time, however, the analysis was not restricted to technological feasibility: “it is considered that the costs related to switching from the production of one type of heavy truck to another would not, *per se*, be considered substantial. Therefore, it is considered that the different types of heavy trucks do not constitute separate product markets.”<sup>69</sup> The Commission rightly compared the size of those switching costs to the attractiveness of the destination market before reaching its abovementioned conclusion.

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<sup>66</sup> *Volvo/Scania*, Case COMP / M. 1672 [2000.]

<sup>67</sup> *Volvo/Scania*, ¶ 18.

<sup>68</sup> *Volvo/Scania*, ¶ 29.

<sup>69</sup> *Volvo/Scania*, ¶ 29.

Beyond these considerations on the nature of the relevant product market, the Commission's decision in this case was largely dependent on the definition of the relevant geographic market. In contrast with its decision in a previous case,<sup>70</sup> the Commission found that the relevant geographic market was national in scope in Denmark, Finland, Norway, Sweden and Ireland. Had the market being defined at a broader geographical level, the Commission's decision on this merger might have been very different.

The Commission explained its definition of the relevant geographic market mainly by reference to demand-side substitutability: "In defining the relevant geographic market in this case, the question is therefore to what extent it is realistic that, for instance, a truck customer in Sweden would consider buying a truck outside Sweden if prices were raised by 5-10% in Sweden."<sup>71</sup> However, the Commission also considered whether in response to such price increase, suppliers in other countries would switch production and marketing efforts to increase their supply of trucks to Sweden in a relative short period of time. It concluded that no entry was foreseeable in the near future.<sup>72</sup>

In connection to the bus market, the Commission defined three relevant product markets, exactly as in Mercedes-Benz/Kässbohrer: city buses, intercity buses and touring coaches. But this time, unlike in the previous case, the Commission identified substantial barriers to entry linked to both branding and service networks. This discrepancy appears related to the different geographic scope of these two cases: "it may be noted that the Mercedes-Benz/Kässbohrer merger concerned the German markets, which are significantly larger and therefore potentially more attractive for new entrants than any of the Nordic markets [each of which constitutes a relevant geographic market in Volvo/Scania], and that after the Mercedes-Benz/Kässbohrer merger, there remained two independent German bus and coach suppliers ..., whereas this would not be the case in the Nordic countries."<sup>73</sup> Again, the definition of the relevant geographic market appears to have played a central role.

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<sup>70</sup> *Renault/Volvo*, Case IV/M 04 [1991] 4 C.M.L.R. 297; [1990] O.J. C281/2.

<sup>71</sup> European Commission, *Joint DGIII/DGIV Study on Supply-Side Substitutability*, 1999 (revised.)

<sup>72</sup> *Volvo/Scania*, ¶ 132-143.

<sup>73</sup> *Volvo/Scania*, ¶ 129.



### 3.3. Assessment of the Commission's Practice

The analysis of the previous cases as well as many others not reported here shows that, even though supply-side substitution is often taken into consideration, the Commission's definition of the relevant market hinges almost exclusively upon demand-side considerations. "Supply-side substitution, if it is considered at all, tends to be more of an after-thought."<sup>74</sup> Consequently, markets may have been defined too narrowly.<sup>75</sup> Whether this has led to an inappropriate assessment of the degree of competition in the affected markets is less clear, however. This is because the Commission appears to have undertaken a more systematic analysis of supply-side constraints when considering potential entry than at the market definition stage. Although this analysis has not been sufficiently rigorous in some instances ---see *Airtours/First Choice*--- or it has led to seemingly contradictory conclusion ---as in *Mercedes-Benz/Kässbohrer* and *Volvo/Scania*.

The second main conclusion of the previous analysis of the case law is that the Commission's practical approach to supply-side substitutability is rather inconsistent. In some cases (*DuPont/ICI*) the possibility of supply-side substitutability is carefully researched, while in others (*Ciba-Geigy/Sandoz*) it is not even mentioned in the Commission's final decision. There is no clear-cut explanation for this lack of consistency.

The Commission's practice in these cases shows that supply-side substitutes are incorporated to the market definition only when substitutability is nearly universal. Thus, for example, the Commission considered supply-side substitution in its definition of the relevant market in *DuPont/ICI* where it found evidence that switching production from one variety to another was easy and could be done immediately, and, what is more important, all suppliers offered or could offer a full product range. Consistently, it disregarded supply-side substitution in *Agfa-Gevaert/DuPont*, because *not all* production lines could produce both kinds of varieties (plates).

It would be most helpful, however, if the Commission clarifies its views on market aggregation and supply-side substitution. And it should do it not only on this issue, perhaps. For instance, it is also unclear how the Commission interprets in practice when supply-side substitution effects can be assimilated to those of demand-side substitution. For example, in *Aerospatiale/Alenia-de Havilland*, supply-side substitution was not considered because switching production was said to take a minimum of 3 years even when there are reasons to believe that its impact on competition could be immediate.

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<sup>74</sup> Bishop and Walker (1999), page 56.

<sup>75</sup> Bishop and Walker (1999), page 64.

The Commission's analysis of supply-side substitutability in these cases, and also its analysis of potential entry, focuses almost exclusively on technology, paying very limited attention to economic incentives. In *DuPont/ICI* and *Agfa-Gevaert/DuPont* the Commission investigated whether switching production from one variety to another is technologically feasible within a sort period of time. But it did not consider whether the companies involved would have the economic incentives to do so. This requires considering not only the costs of product substitution (entry) but also its likely benefits. It is not enough to argue that entry barriers are high or low. This question is just instrumental. What matters is whether supply-side substitution will exert a significant competitive constraint on incumbents and, therefore, on competition conditions *ex post*.

In some of the cases analysed above, information on the composition of the competitors' product lines prior to the merger was used to assess their ability to adjust their facilities to manufacture the relevant products. While this information may be helpful to assess their ability to switch production, it is not conclusive. In particular, it does not tell us whether suppliers will indeed switch production in response to higher prices *ex post*. The relevant question to be answered is whether competitors would readily switch production to the relevant products in response to a hypothetical small but permanent relative price increase.

In sum, the analysis of the previous cases does not provide a consistent picture. The Commission's practical approach to supply substitution for the purposes of market definition appears to be contradictory and not clearly grounded on the Commission's own *Notice*.

In our opinion, the main problems are:

- The Commission appears to award great importance and to allocate most of its investigative efforts to the analysis of the technology. Economic incentives are less carefully studied.
- Although both the *Notice* and the Commission's practice suggest that markets will only be aggregated in response to supply-side constraints when supply-side substitutability is nearly universal, some further clarification on this matter may be necessary.
- Supply-substitution constraints are more often analysed looking backwards at pre-merger competition conditions. There is no real prospective analysis of divertible production, excess capacity, input bottlenecks, etc.
- Supply-side factors should be considered in a more systematic way. While they receive lots of attention in some cases, they are entirely neglected in others. There may be good reasons for this, but they are not always made explicit and/or sufficiently justified.

## 4. SUPPLY-SIDE SUBSTITUTION IN OTHER JURISDICTIONS

We now proceed to extend the analysis of the previous chapter to other two jurisdictions: the United Kingdom (Section 4.1) and the United States (Section 4.2).

### 4.1. Supply-Side Substitution in UK Merger Control<sup>76</sup>

The guidelines on market definition published by the Office of Fair Trading (OFT) in March 1999 establish when and how supply-side substitutability will be used to define markets under the 1998 Competition Act.<sup>77</sup> According to the OFT guidelines, supply-side substitution will be included within the market definition when “it is clear that substitution would take place quickly and easily.”<sup>78</sup> As in the case of European Competition law, whose *Notice on market definition* is broadly followed, supply-side substitutes are taken into account in the derivation of market shares by identifying a set of products whose suppliers would switch to the relevant product if prices rose. “It is the products rather than the undertakings which are added to the market definition.”<sup>79</sup> However, the guidelines do not clearly specify whether such market aggregation requires that *most* suppliers of supply-side substitutes switch to the relevant product in response to a price increase---i.e., that substitution be nearly universal.<sup>80</sup> And, consequently, it is hard to evaluate the appropriateness of the OFT guidelines from the point of view of the analysis developed in Chapter 2 above.

The following cases provide recent examples in which the Competition Commission, formerly known as the Monopolies and Mergers Commission, has explicitly considered supply-side substitution into its market definition exercises. As we shall see shortly, the Competition Commission regularly makes use of supply-side substitution considerations for defining relevant markets. Supply-side substitution is taken into account at the market definition stage only when the readjustment in production can be done without incurring irreversible costs and in a relative short time. In all the other cases, it is considered as part of the assessment of potential entry. Also it seems that the Commission tends to aggregate

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<sup>76</sup> I wish to thank Almudena Lara-Tejero for providing valuable research assistance on the UK experience.

<sup>77</sup> Office of Fair Trading, “Market Definition in the UK Competition Policy,” *OFT Research Paper*, March 1999.

<sup>78</sup> Op. Cit. ¶ 3.19.

<sup>79</sup> Op. Cit. ¶ 3.21.

<sup>80</sup> The coated paper example cited in Op. Cit. ¶¶ 3.14 and 3.18 suggests that near-universal substitutability is required. No formal statement is made, though.

markets on the basis of supply-side considerations only when substitutability is near universal. The evidence on this last point is, however, inconclusive.

#### **4.1.1. London Clubs International-Capital Corporation (1997)<sup>81</sup>**

The merger between Capital Corporation and London Clubs International concerned two companies operating casinos in the London area. The Competition Commission segmented the (London) market into two, distinguishing between up-market and down-market casinos because: (a) the two types were considered sufficiently different and (b) supply-side substitution was regarded extremely difficult. Surprisingly, however, the Commission considered that demand-side substitution was both feasible and likely. The approach followed by the Commission in this case appears to be incorrect. A relevant product market should comprise a set of products that is worth monopolizing. There are two different sorts of reasons why a given set of products may not constitute a relevant product market: demand substitution *or* supply substitution. But then, as Bishop and Walker (1999, p. 57) note "... having considered one form of substitution, consideration of the other can only widen the market--it will never imply that the market should be narrowed again." Given the possibility of demand substitution, the Commission should have not segmented the market on the basis of a lack of supply-side response.

#### **4.1.2. Tomkins-Kerry Group (1998)<sup>82</sup>**

This merger gave rise to concerns on the supply of flour, particularly free flour including free flour supplied to bakers. Tomkins and Kerry, the leading two suppliers of this product would have accounted for about 60 per cent of the output of flour in the UK, and about 55 per cent of the production of bread. The relevant product market was defined as the market for hard and soft free flour. In defining the market the Commission took into account supply-side considerations. Several degrees of segmentation were considered for market definition purposes. For example the existence of a separate market for soft and hard flour was examined, since these two products are non-substitutable from the consumer's point of view. Nevertheless the Commission considered that they form part of the same market since

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<sup>81</sup> *London Clubs International plc and Capital Corporation plc: A Report on the Merger Situation*, H. Commons/Command No. Cm 3721, August 5<sup>th</sup>, 1997.

<sup>82</sup> *Tomkins plc and Kerry Group plc: A Report on the Merger Situation*, H. Commons/Command No. Cm 4031, September 25<sup>th</sup>, 1998.

most mills can produce both types of flour and, at the margin, can change the level of production of the two types of flour quite quickly and with little cost. In other words, the Competition Commission made (implicit) use of the same “near-universal substitutability test” that the European Commission appears to use for the purposes of market aggregation in response to supply-side considerations.

#### **4.1.3. Universal Foods-Pointing Holding (1999)<sup>83</sup>**

The inquiry analysed the effects of the acquisition by Universal Food of Pointing Holding. Both companies overlapped in the manufacture and distribution of synthetic flavours and colours for food applications, which was defined as the relevant market. In defining the market the Competition Commission considered the possibility of supply-side substitutability from manufacturers of natural food colour and from those manufacturers of synthetic dyestuff for non-food applications. With respect to natural food colour manufacturers the Commission concluded that the processes involved in the manufacture of both products were substantially different. It, therefore, concluded that the scope for substitution was fairly limited. The ability of manufacturers of colours for the cosmetic industry to switch into food production was also considered to be rather limited because of the extra health requirements for the colours produced for food purposes. The possibility of substitution from the pharmaceutical industry was also rejected since the colours produced in that industry were not pure colours and, consequently, they could not be used for consumption. As a result, the manufacture and supply of synthetic colours for the food industry was considered to delineate a separate relevant market.

#### **4.1.4. Rockwool-Owens-Corning Building Products (OCBP) (1999)<sup>84</sup>**

The case concerned the merger of Rockwool and OCBP. Rockwool was the world largest manufacturer of stone wool, an insulation material, and OCBP was also a manufacturer of stone wool and a manufacturer of glass wool, another insulation material. Other manufacturers produced different types of insulation materials. The production of stone wool was defined as the relevant market. The Competition Commission considered that a

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<sup>83</sup> *Universal Foods Corporation and Pointings Holdings Limited: A Report on the Merger Situation*, H. Commons/Command No. Cm 4544, December 21<sup>st</sup>, 1999.

<sup>84</sup> *Rockwool Ltd. and Owens-Corning Building Products (UK) Ltd: A Report on the Proposed Merger*, H. Commons/Command No. Cm 4330, April 7<sup>th</sup>, 1999.

substantial degree of investment was needed by manufacturers of alternative materials to switch into the production of stone wool and that, consequently, this possibility should not be considered at the market definition stage.

#### **4.1.5. Alanod Aluminium-Metalloxyd Ano-Coil (2000)<sup>85</sup>**

The merging parties produced and supplied a range of surface (anodised) aluminium coil and strip products, including both highly reflective grades, and various products with less reflective, ridged and matt finishes. Most suppliers of these products offered 20 or more different product types or grades of specular and non-specular anodised aluminium. Aluminium coil and strip products as a whole were considered to constitute the relevant market. Specular and non-specular finishes are not obvious substitutes on the demand side. They are typically used for different, although related, applications. However, the Commission took into account that both grades could be produced on the same production line and considered them to be close substitutes on the supply side. Existing producers of anodised materials were in general found able to switch production from one grade to another in response to market signals whether changes in the pattern of demand or changes in the relative prices. Consequently, the Competition Commission concluded that all grades of conventional coil anodized aluminium, whether specular or non-specular formed part of the same relevant market. Again, the Competition Commission appears to rely, albeit implicitly, on the “near-universal substitutability” test described in Chapter 2 above.

## **4.2. Supply-Side Substitution in US Merger Control**

The 1992 *Horizontal Merger Guidelines* issued jointly by the United States Department of Justice and the Federal Trade Commission define relevant markets for the purpose of merger control.<sup>86</sup> The *Guidelines* define the relevant market as: “a product or group of products and a geographical area in which it is produced or sold such that a hypothetical profit-maximizing firm, not subject to price regulation, that was the only present and future producer and seller of those products in that area likely would impose at least a ‘small but significant and non-transitory’ increase in price, assuming the terms of sale of all other

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<sup>85</sup> *Alanod Aluminium-Veredlung GmbH and Co and Metalloxyd Ano-Coil Ltd: A Report on the Proposed Merger*, H. Commons/Command No. Cm 4545, January 19<sup>th</sup>, 2000.

<sup>86</sup> 1992 *Horizontal Merger Guidelines*, 57 Fed. Reg. 41522; 4 Trade Reg. Rep. (CCH) ¶13,104.

products are held constant. A relevant market is a group of products and a geographic area that is no bigger than necessary to satisfy this test.”<sup>87</sup>

The *Guidelines* attribute a preponderant role to demand substitutability in market definition: “[m]arket definition focuses solely on demand substitution factors--- i.e., possible consumer responses.”<sup>88</sup> On the contrary, “[s]upply substitution factors...are considered...in the identification of the firms that participate in the relevant market and the analysis of entry.” In sum, as noted by Hovenkamp (1999, p. 129),<sup>89</sup> under this analysis, “customer substitution (elasticity of demand) defines the product while producer substitution identifies the firms that are capable of producing the product.”

Once a relevant market has been defined, the US enforcement agencies should, according to the *Guidelines*, measure the market in terms of its participants and concentration. Participants include both current producers of the products within the relevant market as well as firms producing other goods but which, nonetheless, would enter the relevant market rapidly, and without incurring significant sunk costs of entry and exit, in response to a “small but significant and non-transitory” price increase. These entrants are denoted as “uncommitted entrants” by the enforcement agencies. They may already be in possession of assets that could be shifted or extended into production and sale of the relevant product, or else they may be able to acquire them to enter production within one year and without the expenditure of significant sunk costs.<sup>90</sup> According to the *Guidelines*, a “significant sunk cost is one which would not be recouped within one year of the commencement of the supply response, assuming a ‘small but significant and non-transitory’ price increase in the relevant market.”<sup>91</sup>

Market shares will be calculated for all firms identified as market participants “based on the total sales or capacity currently devoted to the relevant market together with that which likely would be devoted to the relevant market in response to a ‘small but significant and

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<sup>87</sup> 1992 *Horizontal Merger Guidelines*, §1.0.

<sup>88</sup> 1992 *Horizontal Merger Guidelines*, §1.0.

<sup>89</sup> Herbert Hovenkamp, *Federal Antitrust Policy*, Minnesota: West Group, 1999.

<sup>90</sup> Product substitution “refers to the shift by a firm in the use of assets from producing and selling one product to producing and selling another.” Product extension “refers to the use of those assets...both for their current production and for production of the relevant product.” (1992 *Horizontal Merger Guidelines*, §1.321.)

<sup>91</sup> 1992 *Horizontal Merger Guidelines*, §1.32.

non-transitory' price increase."<sup>92</sup> The production capacity of producers of supply-side substitutes would be taken into consideration at this stage *only if* such capacity is not committed or profitably employed outside the relevant market. In this last respect, the US antitrust agencies will take into account the costs of substitution, extension and/or acquisition relative to the profitability of the sales made in the relevant market at the elevated price. Note that the production capacity of "committed entrants"---i.e., firms that must make a substantial and irreversible investment to enter the relevant market---is taken into consideration at the entry stage.

The *Guidelines* incorporate supply-side responses either in the identification of market participants ---in order to calculate market shares and concentration ratios--- or at the entry stage ---when the authorities assess whether entry will likely deter or counteract the anti-competitive effects of a merger. In general, supply-side substitution will not be reflected in the description of the relevant product market. There is an exception to this rule, however. According to the *Guidelines* "[i]f production substitution among a group of products is nearly universal among the firms selling one or more of those products...[the authorities] may use an aggregate description of those matters as a matter of convenience."<sup>93</sup> Note that market aggregation is advocated only when substitutability is *nearly universal*. This is well illustrated in the following example.<sup>94</sup>

#### **4.2.1. United States v. Georgia-Pacific and Fort James (2000)<sup>95</sup>**

On November 21, 2000, the United States Justice Department filed a complaint alleging that the acquisition of Fort James by Georgia-Pacific would substantially lessen competition in the "away-from-home (AFH) tissue market" in the United States. The Justice Department also filed a proposed settlement: Georgia-Pacific would be allowed to acquire Fort James after divesting its own AFH tissue business. This divestiture was considered sufficient to restore competition. On January 25, 2001, the Justice Department filed a Competitive Impact

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<sup>92</sup>1992 *Horizontal Merger Guidelines*, §1.4.

<sup>93</sup> 1992 *Horizontal Merger Guidelines*, footnote 14.

<sup>94</sup> In spite of our efforts, we have found no examples of recent merger cases where the US authorities applied supply-substitution arguments to calculate market shares for uncommitted entrants.

<sup>95</sup> *United States v. Georgia-Pacific Corporation and Fort James Corporation*, Civil Action No.: 00 2824 (RWR).



Statement, which, among other things, explained the definition of the relevant market in this civil antitrust proceeding.

AFH tissue products are tissue products consumed primarily in commercial and other away-from-home establishments. The Justice Department considered that there were three different categories of AFH tissue products, which were no interchangeable substitutes from a demand viewpoint: AFH bathroom tissue, AFH paper napkins and AFH paper towels.

AFH tissue products differ from retail tissue products in various functional and perceived characteristics. Because of these differences, they cannot be regarded as demand substitutes and, therefore, cannot be part of the same relevant market. Furthermore, AFH tissue products are often produced using specialized equipments and, what is most important, a significant number of tissue product manufacturers produce only AFH or retail tissue products, but not both. That is, AFH and retail tissue products are not nearly universal supply-side substitutes and, consequently, according to the near universal substitutability test sponsored by the *Guidelines*, the markets for these two products should not be aggregated.

On the contrary, the Justice Department considered that, notwithstanding the lack of demand substitutability, the markets for AFH bathroom tissue, AFH paper napkins and AFH paper towels could be usefully aggregated into the “AFH tissue market.” The reason being that the manufacturing process of AFH tissue products permits supply substitution by a significant number of AFH tissue manufacturers among the three AFH tissue products. In other words, the near-universal substitutability test holds.<sup>96</sup>

### **4.3. Concluding remarks.**

In this chapter we have succinctly reviewed the role of supply-side substitution in the UK and US merger control. Both the law and practice in the UK appear to be closely related to EU Community law and practice. Supply-side substitution in the UK plays a role for market definition (i.e. market aggregation) only. Although it is not formally stated, the markets for

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<sup>96</sup> The Justice Department’s conclusions in this case relied on technological considerations only. No attention seems to have been given to the economic incentives to switching. This is clearly unsatisfactory, as we discussed in section 3.2 where we reviewed the European Commission’s practice in this respect.

products that are not demand-related appear to be aggregated only if supply-side substitution is nearly universal. UK practice, however, shows similar shortcomings to European practice: namely, lack of consistency, undue emphasis on technological considerations and inadequate considerations of economic incentives to switching.

According to the US *Horizontal Merger Guidelines*, supply-side substitution should in general be considered once the market has been defined in the calculation of market shares. The enforcement agencies are instructed to identify potential sources of supply-side substitution and attribute them “virtual” market shares. This requires a careful analysis of divertible production; one that may prove too difficult in practice. The *Merger Guidelines* deal with the implications of supply-side substitution for market aggregation only briefly on footnote 14. Market aggregation requires supply-side substitution to be nearly universal. Yet, in practice, the US authorities appear to adopt a policy that has lots to do with European practice, and so the difference between the two approaches are by and large more theoretical than practical.

## 5. MARKET DEFINITION, SUPPLY-SIDE SUBSTITUTION AND THE NEW ECONOMY

This chapter considers whether supply-side substitutability should be awarded a greater role in market definition in new-economy industries. We proceed in two steps. First, we conduct in Section 5.1 a brief review of the main economic characteristics of new-economy industries (which are considered in greater detail in the Appendix). Then, in Sections 5.2 and 5.3, we investigate the implications of these characteristics for market definition, paying particular attention to the interconnection between supply-side substitution and market aggregation.

### 5.1. The Simple Economics of New-Economy Industries<sup>97</sup>

New-economy sectors are acquiring a growing importance as the European economy evolves. The new economy mainly encompasses high-technology industries such as computer software and hardware, the Internet, mobile telephony, biotechnology and others that are based primarily on the creation of intellectual property and that are undergoing rapid technological change. Although Europe is still lagging behind the United States and Japan in most of these industries,<sup>98</sup> it now leads in mobile telephony, with Nokia---a Finnish company---as the largest producer of mobile phones worldwide.<sup>99</sup> Europe has also a steadily growing software industry, where several companies---most notably, Germany's SAP---have become leaders in their fields.<sup>100</sup>

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<sup>97</sup> This section draws extensively from Christian Ahlborn, David S. Evans and Atilano Jorge Padilla, "Competition Policy in the New Economy: Is European Competition Law Up to the Challenge?," *European Competition Law Review*, forthcoming May 2001; and David S. Evans and Richard Schmalensee, "Some Economic Aspects of Antitrust Analysis in Dynamically Competitive Industries," NBER Working Paper No., April 2001.

<sup>98</sup> "Of the world's 50 largest IT companies by revenue, 36 are American, 9 Japanese and only 4 European." *The Economist*, "Catch up if you can," September 23<sup>rd</sup>, 2000, page 34.

<sup>99</sup> Nokia's market share in the third quarter of 2000 was 32%. Its main competitors are Motorola (United States) with 13.9% of the market, Ericsson (Sweden) with 10.1%, Siemens (Germany) with 8% and Alcatel (France) with 5.8% (data available at <http://www.Dataquest.com>.)

<sup>100</sup> SAP AG, a German company founded in 1972 by five former IBM systems engineers is now the third largest software company in the world and the largest ERP software vendor. According to Morgan Stanley Dean Witter's estimates, SAP's share of the total license revenue generated in the ERP market in 1998 was 39%. This figure climbs up to 45%, or even more than 57% when we measure SAP's market share in terms of the number of ERP licenses or, respectively, the number of ERP seats. (Data available at <http://www.msdc.com/institutional/eEnterpriseSoftware/databank2/MarketSizing.pdf>.)

New-economy industries differ from older industries in a number of ways. In the words of Richard A. Posner (2000): “The new-economy industries ... are characterised ... by falling average costs (on product, not firm, basis) over a broad range of output, modest capital requirements relative to what is available for new enterprises from the modern capital market, very high rates of innovation, quick and frequent entry and exit, and economies of scale and consumption (also known as “network externalities.”)”<sup>101</sup>

The defining feature of new-economy industries is that firms engage in dynamic competition *for* the market, i.e. in a process of “creative destruction” whereby drastic innovation makes market leadership highly contestable. Meanwhile, in old-economy industries, competition takes place primarily through standard price competition and, perhaps, also via incremental innovations. In the Appendix at the end of this section, we proceed to review these characteristics (and other related ones) in greater detail.

## **5.2. Implications for Market Definition**

As we saw above, competition policy in Europe rests heavily on the concept of “dominance.” The European Commission follows a two-step approach to assess whether a firm enjoys a dominant position. First, the Commission defines the relevant market and, then, it proceeds to investigate whether the firm can act within the boundaries of such market independently of its competitors, customers and final consumers. In this section, we show that the Commission’s standard practices in conducting each one of these two steps turn out to be problematic when applied to new-economy industries.

The definition of the relevant market in Community law largely relies on demand-side substitutability. But by focusing mainly on the demand side, the Commission may fail to take properly into account that product innovation is key in new-economy industries, where competition does not come from readily available demand substitutes as very often a single product serves the entire market (see Appendix, point 2). Instead, the main competitive constraint stems from potential competitors not currently in the market. That is, it originates from new, superior products, whose time of introduction is most often uncertain. As noted by Evans and Schmalensee (2001), these firms “are not constrained much by the pricing or

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<sup>101</sup> Richard A. Posner, “Antitrust in the New Economy,” *John M. Olin Law & Economics Working Paper*, No. 106 (2<sup>nd</sup> series), 2000.

production decisions of existing firms, because they typically face few if any contemporaneous rivals, and scale economies and network effects are often effective barriers to the entry of comparable...products.”<sup>102</sup>

The traditional market definition analysis, which focuses on identifying readily available constraints on firms’ price/output decisions, can present a seriously misleading picture of competition in high-tech industries. In these industries, firms are primarily constrained by the threat that another firm will come up with a drastic innovation that causes demand for the incumbent’s product to vanish. The recent history of these industries demonstrates that dynamic competition takes place among firms that are not necessarily competitors in the “static” markets that competition practitioners ordinarily define (see Appendix, point 4).

A second, but closely related, problem may have to do with the Commission’s strong reliance on market share data to establish dominance. Market shares are also used as indicators of market power in merger control as well as in the competitive assessment of horizontal and vertical agreements. But in new-economy industries the incumbent typically has a large market share, as competition often exhibits so-called “winner-takes-all” features. These large market shares are, however, under the permanent threat of entry from innovating competitors. Incumbents can only retain their leadership position if they continue to innovate. Thus, equating high market shares with dominance in new-economy industries (and also in many old-economy ones<sup>103</sup>) may often lead to an incorrect finding of dominance. Dominant positions in these industries tend to be fragile as leaders end up sooner or later being replaced by entrants with innovative products (see Appendix, point 4). Consequently, the competitive assessment of these industries should be centred on an analysis of the ease of entry. That is, it should be based on an examination of actual and potential innovative threats to leading firms. As Evans and Schmalensee (2001) sustain: “[market definition] cannot be a simple exercise in drawing boundaries and computing shares or even looking at traditional barriers to entry. It generally involves the exercise of

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<sup>102</sup> Op. Cit. p. 21.

<sup>103</sup> In particular, in those characterized by “endogenous sunk costs”, where firms compete by investing in advertising, product design and or research and development. See John Sutton, *Sunk Costs and Market Structure*, MIT Press, 1991.

judgement regarding the likelihood of future races for market dominance and the likely nature of those races.”<sup>104</sup>

Defining relevant markets in new-economy industries not only presents potentially severe conceptual problems, it also involves various analytical difficulties. Most indicia typically used by competition authorities, and in particular the European Commission, to define relevant markets have limited value in high-technology industries. These include the so-called “SSNIP test,” the physical characteristics of product and intended use, the product prices, and consumer preferences or cross-elasticity of demand.<sup>105</sup>

According to the SSNIP test, the relevant product market is defined as the smallest set of products that is worth monopolising, i.e., the smallest set of products for which a hypothetical monopolist would be able permanently and profitably to raise the price by 5-10%, assuming that the price of all other goods remained constant. The SSNIP test faces a number of problems in high-technology industries (many of which also arise in some old-economy industries). These problems are discussed at length by Pleatsikas and Teece (2001).<sup>106</sup> The most important problem is, perhaps, the difficulty of identifying the level of prices to be used as a benchmark. High-tech products are highly differentiated, exhibiting substantial price and performance variations. For example, firms offer various versions of the same underlying product, each of which is tailored to a specific group of users. Different versions have different prices and also different functionalities. This heterogeneity makes it very hard, if not practically impossible, to define an appropriate benchmark.

The SSNIP test is mostly a static test, while competition in these industries is essentially dynamic. Consumers may not have readily available substitutes to switch in response to a small but significant price increase. But this does not imply that the set of products identified by the SSNIP test is worth monopolising. The reason being, as Schumpeter discovered long ago, that incumbents face the threat of entry at any point in time. A threat that is so powerful and real that forces incumbents to price low and, most importantly,

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<sup>104</sup> Op. Cit. p. 22.

<sup>105</sup> Christian Jones and Enrique González-Díaz, *The EC Merger Regulation*, London: Sweet & Maxwell, 1992, pages 111-114.

<sup>106</sup> Christopher Pleatsikas and David Teece, “The Analysis of Market Definition and Market Power in the Context of Rapid Innovation,” *International Journal of Industrial Organization*, vol. 19, 2001, pages 665-693.

keeps them investing heavily on R&D so as to continue launching new, innovative products into the marketplace. Consequently, as we just noted above, focusing only on immediate responses to small price increases may lead to discard supply-side responses that may effectively constrain other forms of abusive behaviour with significantly more negative implications on consumer welfare than excessive prices.<sup>107</sup>

Furthermore, the SSNIP test typically focuses on price competition only. It might be adjusted to accommodate non-price competition, but this is no simple exercise and, as far as we are aware, it is hardly done in practice. But in new-economy industries, competition takes place through innovation and product differentiation. In these markets, entrants will not discipline incumbents, even those who are charging excessive prices, by undercutting. Network effects and switching costs, among other reasons, may yield these responses ineffective. Instead, potential entrants respond by investing in R&D and developing new, higher quality offerings.

Other factors used in the past by the Commission for the purposes of identifying relevant markets are also problematic in the context of new-economy industries. For instance, subdividing the relevant market based on the different physical characteristics of products may lead to overly narrow markets, given the prominent role played by product differentiation in these industries. Price differences are not much more useful when vertical product differentiation is the norm. Two products may have different prices, simply reflecting differences in quality, and yet they may compete with each other at the margin. And although economic theory suggests that the prices of two competing products should co-move, such co-movements are neither necessary nor sufficient evidence to integrate those two products within the same relevant market. As Pleatsikas and Teece (2001) state: “Price correlation analyses may be relevant to defining the boundaries of relevant antitrust markets only where relatively low levels of product differentiation exist and where

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<sup>107</sup> Note, however, that the SSNIP test considers hypothetical price increases to be “non-transitory,” so that the traditional analysis does account, at least to some extent, that there is a time horizon for potential entry. In practice this time period is taken to be less than a year, which may be a rather rigid and insufficient time horizon for the purposes of market definition.

performance/quality differences are relatively stable over time.”<sup>108</sup> As we have already made clear in numerous occasions, these conditions fail to hold in high-tech industries.

The other main factor used to define relevant markets---and the only one with a solid conceptual foundation---is the cross-elasticity of demand. But in new-economy industries data for estimating cross-elasticities is seldom available. Most often this is because of the absence of multiple offerings at any point in time. The relevant experiment should analyse substitution patterns between the incumbent’s product (which is currently available to consumers) and the hypothetical product offerings of potential entrants. The results of this experiment are necessarily vague and inconclusive, since the price and performance characteristics of the latter set of products are, almost by definition, undefined.

How should we proceed then? There are three possible alternatives. The first would be to attribute a lesser role to the market definition exercise in the competitive assessment of markets. Market shares should not be blindly used as relevant indicators of market power. Market share thresholds should not constitute a cornerstone in the analysis of markets, nor on the study (and much less on the regulation) of firms’ behaviour. Last, but not least, supply-side constraints should be carefully considered at the assessment stage; although this is true across a wide variety of industries, and not just those that form part of the new economy. Given the various conceptual and practical problems described above, this option may constitute the most appropriate approach to define markets and assess market power in high-technology industries. Yet, this approach may be criticised as arbitrary and unpredictable, to the extent that it proposes to abandon the current, well-known, and well-structured (two-step) approach to the study of market power.

The second option is less drastic. It does not involve abandoning the two-step approach followed so far by the Commission. It consists in the amendment of the current framework to account for the specificities of the new economy. This approach has been sponsored by Teece and Coleman (1998).<sup>109</sup> They propose a hedonic framework so as to encompass both price and non-price competition. They also propose a 25% threshold for performance parameters and a four-year entry horizon. The 25% threshold compares with the 5-10%

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<sup>108</sup> Op. Cit. footnote 17, page 674.

<sup>109</sup> David Teece and Michael Coleman, “The Meaning of Monopoly: Antitrust Analysis in High-Technology Industries,” *Antitrust Bulletin*, vol. 43, 1998, pages 801-857.



threshold employed in the traditional SSNIP. Likewise, the 4 years entry horizon constitutes a quite substantial change from the standard 1-2 year horizon typically used by the Commission (as well as the U.S. enforcement agencies.) No attempt is made to explain with precision these different thresholds, so that it is difficult to assess whether they are likely to lead to more accurate market definitions and to improve the assessment of competition in these industries.

Pleatsikas and Teece (2001) propose a different course of action, still within the conceptual boundaries of the current approach to market definition. They identify several indicia that may be useful in assessing the competitiveness of high-tech industries; some of which are already considered but should play a greater role in these industries. The first such indicator is the *depth* of competition, i.e. “the number of firms’ products and/or technologies advancing along a number of similar dimensions.”<sup>110</sup> The greater this number, the more robust is competition likely to be. Another indicator of robust competition in high-technology industries is R&D spending relative to sales. Where *R&D investment* is high, monopolists tend to be fragile. Also, high R&D spending to sales ratios provide a clear indication that competition takes place through innovation. Finally, substantial *shifts in market share* over time also indicate broad competitive markets. However, we should not expect these shifts to take place over short time horizons. Developing and marketing a new product takes time in these industries. Consequently, the appropriate time span should account for this. Pleatsikas and Teece (2001, page 689) consider that the evolution of market shares should be considered for a period of “at least 4-5 years.” Again, we are unable to determine whether this is the appropriate time span or not.

The third alternative is to do nothing; to continue with the standard approach to market definition, as if there were no substantive economic differences between new-economy and old-economy industries. This approach has been defended recently by Joseph Farrell (2001) for whom “there are reasons to expect competitive effects in different dimensions (innovation, quality, price), and their net effect, usually to go together. The shifts in incentives that are fundamental in antitrust economics apply quite broadly, so that price

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<sup>110</sup> Op. Cit., page 688-689.

analysis can often proxy for a fuller competitive analysis.”<sup>111</sup> We have already discussed why the status quo does not represent an appropriate standard for defining relevant markets in new-economy industries. But it may be convenient to note here that (a) there exist many circumstances in which prices and innovation move in opposite directions, and (b) it is difficult to determine a priori when they are positively (or negatively) correlated.

### **5.2.1. Innovation markets in merger control**

The notion of “depth” employed by Pleatsikas and Teece (2001) to assess the competitiveness of high-tech markets is closely related to what has been denoted as “innovation markets approach to merger control.”<sup>112</sup> The basic idea is that competition policy authorities should ensure that no proposed merger reduce the depth of the relevant market by eliminating one or more of the products and/or technologies which may turn out to be “the next big thing.” In other words, merger control should aim to prevent mergers that would reduce competition in innovation.

Since innovation is hard to measure, the innovation markets approach focuses on R&D, the primary innovation-creating activity of firms. According to the *1995 Intellectual Property Guidelines* of the U.S. Department of Justice and the Federal Trade Commission,<sup>113</sup> innovation markets consist of: “... the research and development directed to particular new or improved goods or processes, and the close substitutes for that research and development. The close substitutes are research and development efforts, technologies and goods that significantly constrain the exercise of market power with respect to the relevant research and development, for example, by limiting the ability and incentive of a hypothetical monopolist to retard the pace of research and development.”

Gilbert and Sunshine (1995) propose a simple procedure to implement this approach. It involves five steps:

1. Identify the overlapping R&D activities of the merging firms.

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<sup>111</sup> Joseph Farrell, “Thoughts on Antitrust and Innovation,” Speech Delivered before the National Economists’ Club, Washington D.C., January 25<sup>th</sup>, 2001.

<sup>112</sup> Richard J. Gilbert and Steven C. Sunshine, “Incorporating Dynamic Efficiency Concerns in Merger Analysis: the Use of Innovation Markets,” *Antitrust Law Journal*, vol. 63, 1995, pages 569-601.

<sup>113</sup> U.S. Department of Justice and Federal Trade Commission, *Antitrust Guidelines for the Licensing of Intellectual Property*, 1995.

2. Identify the alternative sources of R&D.
3. Evaluate actual and potential competition for downstream products.
4. Assess the increase in concentration in R&D and competitive effects on R&D investment.
5. Assess the potential R&D efficiencies due to increased scale and scope.

In order to identify the participants in the relevant innovation market, one should look first at those firms that invest in similar R&D projects. One may even proxy the competitive position of a firm within the relevant innovation market by its share of the total industry R&D expenditure. Second, one may also look at potential competition on innovation. In this respect, two questions are appropriate: (a) Are there (human and physical) assets involved in the innovation process that are specific to such process? Because if there are, then the role of potential competition will be small. (b) Does the innovation process exhibit absolute cost advantages? If this is the case, because for instance learning by doing is important, then potential competitors will be at a disadvantage and, therefore, their ability to constrain the behaviour of incumbents will be seriously hampered.

Although the innovation markets approach has received greater attention in the United States than in the European Union, according to Temple Lang (1997): “The practice of the [European] Commission is to consider, when there is specific evidence about competing lines of R&D, whether a merger or agreement is likely to substantially restrict competition in R&D.”<sup>114</sup>

Temple Lang’s statement can be illustrated by referring to the Commission’s analysis and final decision in *DuPont/ICI* (Case IV/M. 214, 1992).<sup>115</sup> This case concerned the acquisition of ICI’s worldwide nylon operations by DuPont. The major groups of end-use applications for nylon are: fibres for textile applications, fibres for industrial applications, and fibres for carpets. The Commission concluded that it was not necessary to decide whether the relevant product market comprised the nylon fibres employed in all sorts of textile applications or, instead, it was to be restricted to fibres employed for specific uses. The same conclusion was

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<sup>114</sup> John Temple Lang, “European Community Antitrust Law: Innovation Markets and High Technology Industries,” in Barry E. Hawk (ed.), *Annual Proceedings of the Fordham Corporate Law Institute, International Antitrust Law and Practice*, chapter 23, 1997, pages 519-599.

<sup>115</sup> *DuPont/ICI*, Case IV / M. 214 [1992] O.J. C007.

reached regarding nylon fibres for industrial uses. These decisions were based on the inexistence of a horizontal overlap between DuPont and ICI for these products. Regarding fibres for carpets, the Commission considered that there was a single relevant product market comprising all nylon fibres used for carpets.

The Commission concluded that the merger would have strengthened the dominant position of DuPont in the relevant market, “in particular with regard to the competition in product development.”<sup>116</sup> DuPont and ICI were indeed the leading companies in terms of quality of products and technological development. ICI was only second to DuPont in both dimensions. The proposed concentration was finally approved after DuPont’s submission of an undertaking, which according to the Commission served “to reduce the likelihood that DuPont could be able to determine the degree of product development and innovation in the market.”<sup>117</sup> The terms of the undertaking were the following:

1. DuPont would reserve capacity to produce ICI’s current product range for the benefit of one independent third party nylon-fibres producer.
2. DuPont would do this for a period of five years, renewable by the selected candidate.
3. DuPont agree to transfer to such third party a free-standing carpet R&D facility comparable in terms of quality to those owned by ICI in various places.
4. DuPont would take all reasonable steps to encourage the competent sales personnel familiar with the business being transferred to take up employment with the third party.
5. DuPont would license exclusively or assign to the selected third party ICI’s “Timbrelle” trademark.

For some authors, the innovation markets approach does not add much to the analysis of innovative industries. According to Rapp (1995): “In most applications, the innovation market approach is merely superfluous ---a new way of talking about potential competition. In some instances, however, the innovation market approach represents a leap into the unknown with a potential for harm to economic welfare as great as any potential benefit. Neither economic theory nor any factual analysis of the connections between market

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<sup>116</sup> *DuPont/ICI*, ¶47.

<sup>117</sup> *DuPont/ICI*, ¶48.

structure, R&D and innovation provides a persuasive basis for the innovation markets approach.”<sup>118</sup>

Rapp’s opinion is based on two observations. First, economic theory does not predict that higher R&D concentration imply lower aggregate R&D investment. The existing evidence is not conclusive. Indeed, R&D concentration may facilitate investment on R&D output if one of the following conditions hold: (i) fixed R&D costs are large, (ii) R&D is risky and (iii) concentration makes it easier to reap the returns from successful R&D. Second, a lower aggregate level of R&D does not necessarily lead to less innovation. In particular, if the merging parties were undertaking similar and complementary R&D projects, concentration may save on duplication of efforts and may facilitate taking advantage of complementary knowledge. Aggregate R&D may fall and yet innovation increases.

Rapp’s word of caution needs to be taken seriously. The implicit “structure-conduct-performance” nature of the innovations markets approach was unsatisfactory. Not surprisingly, it appears that this approach, at least in its most formal and structured form, is no longer employed. Yet, its emphasis on innovation should not be dismissed, even if this imply relying on R&D expenditures as a proxy for dynamic competition in high-tech industries. This may be the only option in the analysis of mergers between firms that might potentially compete in developing new products, but whose current offerings may or may not compete. The alternative presented by Farrell (2001) which, roughly speaking, confirms today’s status quo, may, as discussed above, turn out to be even more problematic.

While the emphasis placed by the innovation markets approach is certainly useful, the methodology that has characterized the implementation of this approach is not appropriate for the assessment of competition in innovative industries. This methodology is backward looking, whereas the right approach would necessarily be forward looking. Furthermore, the current methodology straightjackets the competitive analysis of innovation markets into traditional concentration ratios. The right approach, on the contrary, would involve

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<sup>118</sup> Richard T. Rapp, “The Misapplication of the Innovation Market Approach to Merger Analysis,” *Antitrust Law Journal*, vol. 64, 1995. Other academic papers criticizing the implementation of the innovations market approach are George A. Hay, “Innovations in Antitrust Enforcement,” *Antitrust Law Journal*, vol. 64, 1995 and Robert J. Hoerner, “Innovation Markets: New Wine in Old Bottles,” *Antitrust Law Journal*, vol. 64, 1995.

examination of all innovative threats, including those based on technologies and design approaches that radically differ from those used by the incumbent.

### **5.3. Supply-side substitution**

Hitherto, we have been arguing that supply-side constraints merit extra consideration in new-economy industries because most often they represent the only effective restraint to incumbents' competitive behaviour. In the previous section, however, we did not make any distinction between supply-side substitution and potential competition, and we only indirectly addressed whether supply-side constraints should lead to market aggregation.

We should start by noting that it may be more complicated to distinguish between supply-side substitution and potential competition in new-economy industries than in older industries. These two concepts have been typically distinguished by the length of time between the price increase decided by a dominant firm and the commencement of supply by the new producer. Yet, in new-economy industries, the timing of entry may not be as relevant. As Pleatsikas and Teece (2001) note: "It is not just immediate entry that tempers behaviour in high-technology industries; it is also the threat of the next generation of products and services that is of concern to incumbents."<sup>119</sup> Moreover as they correctly emphasize, "the unpredictability of the timing [of entry] ... may help to constrain behaviour, as current market leaders can never be sure that a shift will not occur tomorrow."<sup>120</sup> Consequently, it may be advisable to extend the entry horizon for market definition purposes (e.g., for the calculation of market shares); that is, to consider as instances of supply-side substitution entry episodes that occur later in time. Furthermore, it may be appropriate to change the benchmark for the analysis of entry to use the duration of the relevant product life cycles rather than a pre-specified period of 1-2 years, which makes no account of the particular idiosyncrasies of different industries.<sup>121</sup> In any event, even if we decided not to redefine the scope of supply-side substitutability vis-à-vis potential

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<sup>119</sup> Op. Cit., page 672.

<sup>120</sup> Op. Cit., page 672.

<sup>121</sup> This may well be a theoretical desideratum with few practical implications, since it may prove extremely difficult for competition authorities to forecast what the length of a product life is. Furthermore, this proposal may open a Pandora's box, leading to continuous disputes over the "new-economy" character of the relevant industry, as companies would understandably try to benefit from the relatively more favourable treatment of entry awarded to new-economy industries.

competition, there are certain features of the new economy that make supply-side substitution a much more common and also a much more effective competitive constraint. One of these characteristics is that marginal costs of production are near zero for almost any production level (see Appendix, point 1). Consequently, the magnitude of a potential supply response to a price increase can be as large as required by the market, provided that it is economically profitable to produce the first unit or that any required assets are in place. In other words, in these industries all that we need is to determine whether substitution is technologically feasible and involves no sunk costs, because given low marginal costs of production, it will always makes sense to expand production.

Another feature of the new economy that may lead to wider markets is technological convergence (see Appendix, point 6). Technological convergence (more precisely, convergence in substitutes) facilitates entry of new products into the relevant market and, in particular, it increases the number of potential points of entry into the market in response to a price increase. Convergence in substitutes may thus be a source of demand-side and supply-side substitution and, therefore, of wider and more competitive markets.

Not all economic features of the new economy make supply-side substitution much more likely or lead to wider markets, however. Supply-side substitutability may be hindered by the high sunk costs of entry into these markets (e.g. the huge R&D investments required to launch a substitute product), as well as by network effects on the demand side. The latter may effectively impede any business stealing by new products (i.e. potential supply substitutes.) Network effects act as collective switching costs, thus rendering supply-side substitutability ineffective.

Concerning market aggregation, none of the special features of the new economy justifies a modification of the criteria described in Chapter 2 above, i.e. the “near-universal substitutability test.” That is two products that are not regarded as interchangeable by consumers should be considered part of the same relevant market *only when* they are nearly universal substitutes from a supply-side viewpoint. Or, in other words, in new-economy industries, as in old-economy ones, markets should be aggregated only when most suppliers are in a position to switch production form one product to another with immediacy and at a reasonably low cost.

But even if the criteria for market aggregation remain unchanged, this will tend to be a relatively more common phenomenon in new-economy industries, especially in those selling information goods. This is because in these industries most firms follow a strategy of “versioning.”<sup>122</sup> That is, they offer their information products in different versions for different market segments, i.e. tailored to the needs of different customers. For instance, many personal productivity applications, such as voice-recognition software programs, are offered in two versions: Basic (often called standard) and Premium (also typically denoted as Professional.) Premium versions offer some extra functionality and sell for a higher price. Versioning strategies offer two advantages: (a) they facilitate responding to the competition, if it arises; and (b) low-end versions can be used as a way to promote high-end products. These strategies are not exclusive to the new economy. But versioning information has some special features. As Shapiro and Varian (1999) note: “with information you usually produce the high-quality version first, and then subtract value from it to get the lower quality version.”<sup>123</sup>

Not all producers offer an entire product line, though. There are costs to maintaining several different versions. Furthermore, selling too many versions can lead to user confusion and lower demand. But even if not all information sellers offer an entire product line, it should be by now clear that a manufacturer of a high-end product will often be able to switch production to offer a lower-quality product in response to a price increase and vice versa. And, therefore, even in those circumstances in which consumers do not regard two versions as interchangeable, supply-side substitution arguments should lead to aggregate their markets for competition policy purposes.

## 5.4. Conclusions

In this chapter, we have described the various dimensions in which new-economy industries differ from old-economy ones. The defining characteristic of high technology or new-economy industries is the emphasis on innovation as a dynamic competitive tool. Firms compete to achieve a temporary monopoly in the market, their position being constantly under the threat of potential competitors with superior products, whose time of entry is

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<sup>122</sup> Carl Shapiro and Hal R. Varian, *Information Rules*, Boston: Harvard Business School Press, chapter 3, 1999.

<sup>123</sup> Op. Cit., page 63.



however uncertain. Some authors consider that these changes are not sufficiently important to require modification of the current, two-step approach to market definition. They sustain that the current tests provide enough information to accurately define markets in these industries. Other authors consider that even though the current approach may be conceptually correct, it needs to be adjusted in response to the special features of the new economy. Finally, others consider that what should be questioned is the role of market definition for the assessment of market power in these industries. These authors argue in favour of attributing a lesser role for market definition and market shares; a suggestion with which we find ourselves in agreement, at least as a guiding principle.

## **Appendix: The Economic Characteristics of Dynamically Competitive Industries**

### ***1. Economies of Scale in Production***

New-economy industries tend to have high fixed costs and low marginal costs of production. This is because developing a new, innovative product requires heavy investment, possibly in research and development. But it may also be because new-economy firms often need to invest in a physical or virtual network to create and distribute their products. Once these initial investments are made, the incremental costs of additional units are fairly low; sometimes close to zero. Consequently, new-economy industries exhibit important supply-side economies of scale or “increasing returns.” Successful innovators must charge more than marginal cost, because otherwise they would not be able to be compensated for the high fixed costs and the high risk inherent in the investment. In other words, the rational expectation of significant market power for some period of time is a necessary condition for dynamic competition to exist in high-tech industries.

This has a clear-cut implication for market structure: new-economy industries will tend to be concentrated. This is not all that new, though, for as there are various old-economy industries (such as electricity, gas, steel, etc.) that are also subject to increasing returns. What is really new in new-economy industries is that marginal costs are near zero and that increasing returns often combine with substantial economies of scale in the demand side, i.e. network effects. Both features have important implications for the economic analysis of markets. As we shall see next, network effects have important effects on both market structure (concentration) and firm behaviour (pricing). The fact that marginal costs are negligible may also have dramatic consequences. First, the output response to a price increase will likely be large, as incumbents face no capacity constraint. This will tend to make supply-side substitution a much more credible and effective constraint. And it also has implications for the credibility of those predatory pricing claims that are based only on evidence of low prices.

### ***2. Network Effects***

Many new-economy industries are characterised by network effects or network externalities. That is, their products are more valuable to consumers when more people make use of them.

For instance, an operating system is more valuable to each user the more other consumers use this standard. This is because it makes it easier for consumers to exchange files with each other, and also because more software developers will write applications for this standard. Network effects also constitute a typical feature of many Internet businesses. For instance, the value of a B2B site for buyers increases in the number of sellers, and similarly the value of the site for sellers is increasing in the number of buyers.

Network effects have important implications for market structure because dominance by one firm, or at most a few ones, will be the norm. These effects tend to reinforce the position of market leaders. They also have an impact on firms' conduct, since prices will naturally depend on network size. Firms may initially price their goods low so as to build a larger network. Later, they will raise prices to reap the rents generated by a larger network size. Scale economies in production together with network effects on the demand side will typically result in a single firm with lowest costs and a large share of the market. Consumers will benefit from lower prices and greater standardisation. Breaking up consolidated networks for the sake of market fragmentation would thus reduce consumers' satisfaction and welfare and, hence, it should be considered bad competition policy.

### ***3. Durable Goods***

New-economy industries often produce durable goods (whose actual durability is a function of technological obsolescence). For instance, nobody acquires a second copy of the same PC game for his/her own consumption. This is because one can enjoy playing the same game many times without having to acquire a new copy. Most information goods exhibit the same properties, since information can be used and reused almost without limit. This has substantive implications for pricing strategy as well as for the life cycle of products. New-economy firms selling information goods are bound to compete with their previous sales, which encourages them to keep their prices low. This is because consumers anticipating low prices in the future (when most of them will have already acquired the good) withhold their current consumption, which forces firms to set lower current prices to boost consumption. This is the so-called Coase conjecture (after Ronald Coase, a Nobel-laureate economist). In

short, market power may be less of a problem in durable-goods industries, such as those that we take to be part of the new economy.<sup>124</sup>

#### **4. *Dynamic Competition***

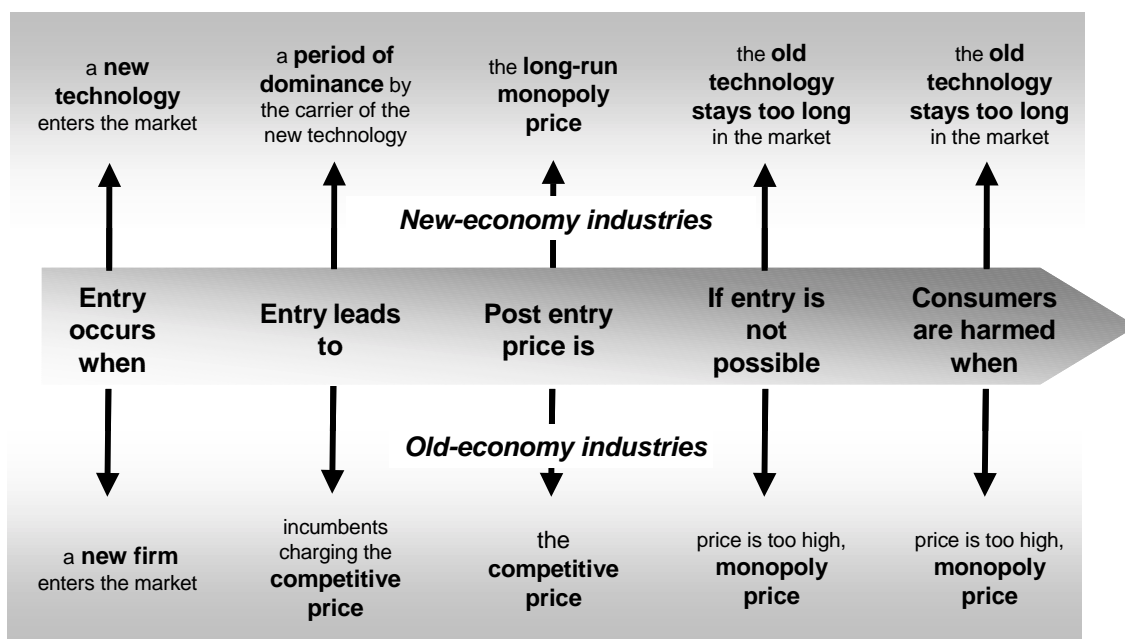
Competition in new-economy industries is dynamic and often consists of a series of races for market dominance. Firms do not compete by slightly undercutting each other. Instead, they engage in what economist Joseph A. Schumpeter described as a “perennial gale of creative destruction” that “strikes not at the margins of the profits of the existing firms but at their foundations and their very lives.”<sup>125</sup>

In the first race firms invest heavily to develop a product that creates a new category. Winners get huge market shares and enjoy substantial profits. These “prizes” for winners provide the appropriate incentives for investment. Indeed, the return to successful innovators in new-economy industries is most often enormous. Winners receive huge profits that offset the huge losses incurred by many losers. In the aggregate, entrepreneurs and investors will invest until the expected rate of return, adjusted for risk, is equal to the opportunity cost of their funds. That is, the expected value of profits ex ante is set at the competitive level. Therefore, the fact that successful firms are very profitable is not an indication that competition is failing.

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<sup>124</sup> Producers of durable goods may, however, restore their market power by leasing (rather than selling) their goods (see Jeremy Bulow, “Durable Goods Monopolists,” *Journal of Political Economy*, 1982), by including non-durable substitutes or complements into their product lines (see Kai-Uwe Kühn and Atilano Jorge Padilla, “Product Line Decisions and the Coase Conjecture,” *RAND Journal of Economics*, 1996), among other alternatives (see Jean Tirole, *The Theory of Industrial Organization*, MIT Press, 1988).

<sup>125</sup> Joseph A. Schumpeter, *Capitalism, Socialism and Democracy*, Harper Collins Publishers 1984 ed., 1942, page 84.

**Figure 5.1. The old and the new economy contrasted**

In subsequent races, firms invest heavily to displace the leader by leapfrogging its technology. Sooner or later competitors seriously contest current leadership in the market. Indeed, leaders are bound to be replaced by their followers unless they invest heavily on various technological fronts. From word processors to spreadsheets, from desktop publishing to personal finance applications, the identity of the leader could not be sustained for a period longer than ten years. The history of high-tech industries has shown that major innovations occur repeatedly, and neither individual switching costs (e.g. learning costs) nor network effects prevent displacement of category leaders by superior products.<sup>126</sup>

In these industries competition takes place for the market, rather than in the market. Firms compete by launching new, superior products in a quest for market dominance. Or, in other words, competition comes not from readily available substitutes but from new, innovative products not yet present in the marketplace. However those that succeed are nothing else than “fragile” monopolists, because they can only retain their position if they continue to innovate. As noted by Shapiro and Varian (1999): “...the information economy is populated

<sup>126</sup> See S.E. Margolis and S.J. Liebowitz, “Causes and Consequences of Market Leadership in Application Software,” in *Winners, Losers, & Microsoft: Competition and Antitrust in High Technology*, Oakland: Independent Institute, 1999; and David S. Evans, A. Nichols, and B. Reddy, “The Rise and Fall of Leaders in Personal Computer Software,” NERA (available at [http://www.neramicrosoft.com/NeraDocuments/Analyses/rise\\_and\\_fall.pdf](http://www.neramicrosoft.com/NeraDocuments/Analyses/rise_and_fall.pdf))

by temporary, or fragile, monopolies. Hardware and software firms vie for dominance, knowing that today's leading technology or architecture will, more likely than not, be toppled in short order by an upstart with superior technology."<sup>127</sup>

The competitive constraint faced by any incumbent stems mostly from forces outside the market rather than from existing competitors. According to Schumpeter: "It is hardly necessary to point out that competition of the kind we now have in mind acts not only when in being but also when it is merely an ever present threat. It disciplines before it attacks. The businessman feels himself to be in a competitive situation even if he is alone in his field or if, although not alone, he holds a position such that investigating government experts fail to see any effective competition between him and any other firms in the same or a neighbouring field and in consequence conclude that his talk, under examination, about his competitive sorrows is all make-believe."<sup>128</sup>

A good illustration of this sort of Schumpeterian competition can be found in the pharmaceutical industry. Companies in this industry invest heavily in R&D. According to Pharmaceuticals Research and Manufacturers of America (2000),<sup>129</sup> it takes an average of 14.9 years and \$500 million to develop a new drug. Furthermore, according to the same source, only 1 or 2 of every 10,000 compounds get a license and just 3 out of 10 approved drugs recover average R&D costs. Not surprisingly, industry segments are heavily concentrated, thus allowing successful firms sufficient market power to recover these large fixed costs. Yet, these monopoly positions are temporary. For example, consider the cholesterol drugs market in the United States. In 1992, Zocor (produced by Merck) entered the market, where there were already other two medicines (Mevacor and Pravachol.) In 1996, Zocor was the market leader and it continued to enjoy this position of privilege until 1998, when Lipitor (a Pfizer product introduced in 1997) took over its leadership position.<sup>130</sup>

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<sup>127</sup> Carl Shapiro and Hal Varian, *Information Rules*, Boston: Harvard Business School Press, 1999, page 173.

<sup>128</sup> Op. Cit., page 84.

<sup>129</sup> Pharmaceutical Research and Manufacturers of America, *Pharmaceutical Industry Profile*, 2000, available at <http://www.phrma.org/publications/publications/profile00/>, downloaded on December 13th, 2000.

<sup>130</sup> See American Druggist, February 1997, 1998 and 1999 and Pharmacy Times, 2000. Available at <http://www.idleb.com/>; downloaded on January 3<sup>rd</sup>, 2001.

### **5. *Compatibility and Standardization***

In various new-economy industries, firms compete by producing and commercialising “systems” or “platforms,” which each comprise two or more components. Whether competition takes place at the platform level or at the components level depends on the degree of compatibility between the various components of different systems. Competition takes place at the components level when the components of different producers are all interoperable. Otherwise, when components are incompatible across platforms, competition takes place at the system level. Compatibility is often an endogenous variable: a firm may design its products to be compatible/interoperable with its competitors’ products by, for example, building and selling suitable interfaces. This may be the optimal strategy for an entrant who wishes to induce consumer switching to its new platform. And it may also be the optimal strategy of an entrant with a superior new component who aims at selling that component to the users of incumbent platforms. In sum, whether competition takes place at the system or component level depends on firms’ commercial strategies as much as on purely technological considerations.

At the platform level, the value of one component depends on the complementary components in the system. Firms in high-technology industries have strong incentives to encourage production of high-quality complements. This is true whether these other components are produced in-house or else are developed and manufactured by other firms. In the last case, however, this welfare-enhancing activity will generally require a good deal of inter-firm communication.

Compatibility requirements make standards necessary. The object of standardization is to prevent the failure of a system’s performance because of degradation. These standards may be *de jure* standards, which are formally set either by governments or by standard-setting agencies or, alternatively, *de facto* standards, which arise because one technology becomes the most popular choice in the marketplace. There may be more than one standard at a time, although this is less likely when standards emerge from the market and there are strong network externalities. In the last case, investors will fiercely compete to make their technologies the *de facto* standard. This competitive race to become the next standard is just another form of Schumpeterian competition.

## **6. Technological Convergence**

Technological convergence is perhaps one of the most striking phenomena in the new economy. We can identify two different kinds of convergence: (a) convergence in substitutes and (b) convergence in complements.<sup>131</sup> Two products converge in substitutes when consumers consider either interchangeable with the other. This happens when (i) an increasing number of customers is willing to use them as substitutes in an increasing number of tasks and/or (ii) an increasing number of customers might begin to think of those products as substitutes in a given number of tasks.

For example, during the 1960s to 1980s, IBM dominated the business computer market with its mainframes System/360 and System/370. Technical developments led to the opening of new market segments, such as the minicomputer segment. Mainframe and minicomputer users did not perceive them as substitutes mainly because of their very different technical characteristics. The minicomputer evolved into the super-minicomputer, whose main advantages were convenience, capacity, reliability and low cost for small applications. The super-minicomputer was mainly directed to small administrative users that could not afford an expensive mainframe but who needed reliable software and support services, which minicomputer companies did not offer. After an initial period of innovation, super-minicomputers began to be adopted for simple administrative tasks and competed at the margin with mainframes (i.e., a number of consumers considered them substitutes). Technical convergence led to an entirely new market definition that now includes both mainframes and (new, improved, super-) minicomputers.

Two products converge in complements when they work better together than separately or when they work better together than they worked together formerly. Two ways in which this can take place are: (i) a given set of users can find that two products work better together for a large set of tasks and/or (ii) an increasing number of users can find that two products are complementary for their specific purposes.

An interesting example of convergence in complements is currently taking place in the so-called business-to-business (B2B) software infrastructure market which embraces the

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<sup>131</sup> Shane Greenstein and Tarun Khanna, "What Does Industry Convergence Mean?," in David B. Yoffie (ed.), *Competing in the Age of Digital Convergence*, Harvard Business School Press, Boston, MA, 1997.



following software needs, which were initially produced by separate companies with no virtual links: (a) the procurement window (i.e. the first screen that the buyer sees when initiating a request); (b) the workflow technology that allows buyers to specify procurement rules (i.e. how orders get routed for approvals); (c) the content manager or the technology that allows buyers to load and view suppliers updated catalogues; (d) trading applications or the technology for dynamic pricing, bidding and auctioning; and (e) the back-office or more traditional enterprise resource planning (ERP) systems. As a result of this process of convergence, various separate companies, previously selling disparate products, belong now to an integrated market (their products are now seen as complements). This is the case of Oracle (databases), SAP (ERP software) and Ariba (procurement software).

## 6. CONCLUSIONS

This report has considered the appropriate role of supply-side substitutability in the definition of the relevant market, particularly in the context of merger control. In this respect, we have provided tentative answers to the following questions: Should competition authorities pay attention to supply-side substitutability when defining relevant markets? Should they limit consideration of supply-side substitutability to the calculation of market shares? Or, perhaps, postpone any reference to supply-side substitutability and potential competition to later stages of the competitive analysis? Under which conditions should they do one thing or another? Is there a well-defined legal test (or set of tests) to guide practice on this matter? Are the answers to the previous questions valid for all industries, including so-called new-economy industries?

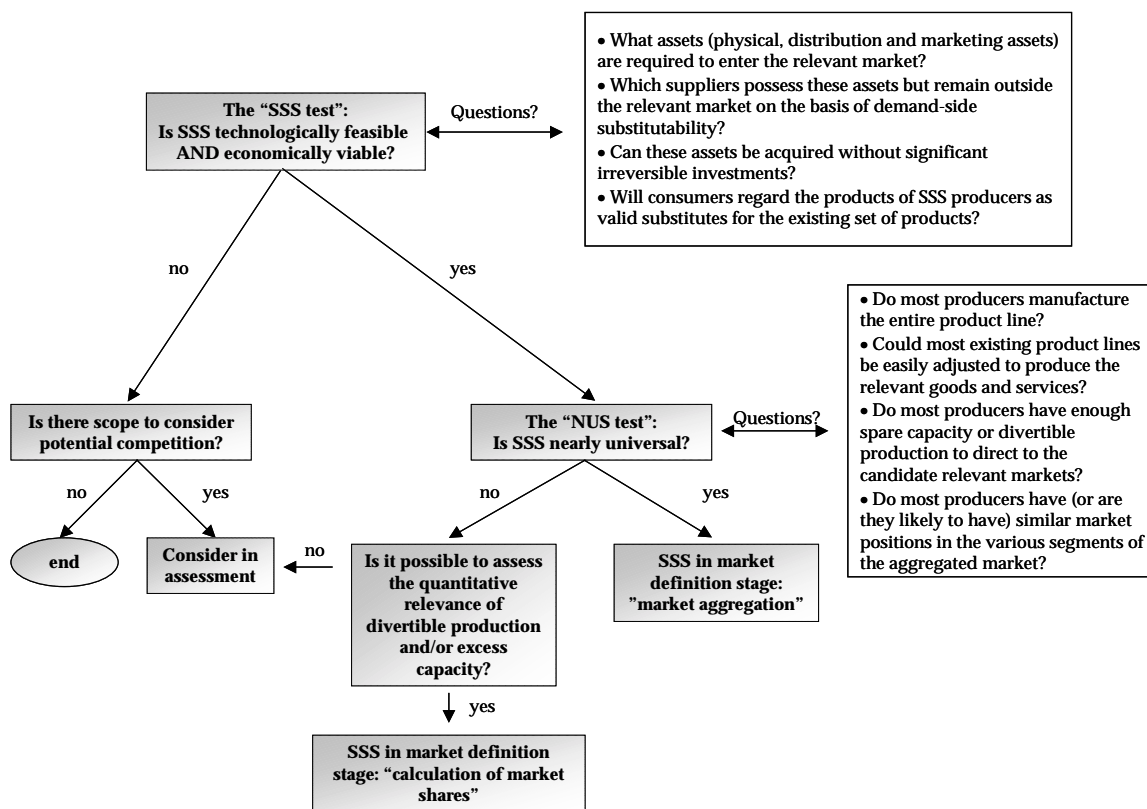
Our main conclusions can be summarised as follows:

1. We consider it appropriate to distinguish between supply-side substitution and potential competition.
2. Supply-side substitution should be incorporated either in the identification of market participants in order to calculate market shares, or else in the definition of the relevant market. Potential competition should, in contrast, be considered at the assessment stage.
3. Consideration of supply-side substitutability constraints should lead to market aggregation only when supply-side substitution is found to be nearly universal, i.e., when production substitution among a group of products is found to be technologically feasible and economically viable for most, if not all, firms selling one or more of those products.
4. When supply-side substitutability is not nearly universal, the market shares attributed to producers of supply-side substitutes should be based on the sales or capacity which likely would be devoted to the relevant market in response to an increase in the prices of the relevant products.

5. In many circumstances, however, assessing the quantitative relevance of supply-side substitution may prove too difficult, if not at all impossible. In those cases, it may be better to postpone consideration of uncommitted entry to the assessment stage. This move requires reducing the excessive weight often attributed to hard evidence on market shares vis-à-vis qualitative data on potential competition.
6. While this approach may be appropriate for the definition of markets in many old-economy industries, it might not be so in high-technology industries, where the conduct of incumbent firms is primarily constrained by the threat that another firm will come up with a drastic innovation that may make the market tip in its favour.
7. Our proposal is to attribute a lesser role to the market definition exercise in the competitive assessment of these markets. Market shares should not be blindly used as relevant indicators of market power in these industries. Supply-side constraints should be carefully considered at the assessment stage.

# SUMMARY DIAGRAM

## THE ROLE OF SUPPLY-SIDE SUBSTITUTION IN MERGER CONTROL



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