

**Definition of the Relevant Market:  
(Lack of) Harmony between Industrial Economics  
and Competition Law**



**Definition of the Relevant Market:  
(Lack of) Harmony between Industrial Economics  
and Competition Law**

Definitie van de relevante markt: (dis) harmonie tussen  
economie en mededingingsrecht

PROEFSCHRIFT

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# Chapter 1

## Introduction

“...the meaning of “relevant market” today for purposes of merger intervention or non-intervention decisions – probably is not understood by more than 500 people on the planet. For most private practitioners, for most business personnel practicing self-help, for most new agency staffers, for most foreign enforcement agencies implementing new merger control regimes, “Market Definition and Measurement” remains a discrete step that begins the analysis. If they err at that step, all ensuing steps are apt to be wrong. And they err a lot”.<sup>1</sup>

### 1.1 The Increasing Role of Economics in EU Competition Policy

The European Union has seen an expansion in the role and scope of economic analysis in competition policy over the last decade. Indeed antitrust<sup>2</sup> and merger analysis has long been based on economic foundations, with concepts such as ‘competition’, ‘monopoly’, ‘oligopoly’ or ‘barriers to entry’ serving a key role in competition law objectives and policy.<sup>3</sup> The legal question, whether it is one of abusive conduct by a dominant undertaking, or lessening of competition by merging parties, is essentially an economic question, requiring competition authorities to analyse the market under investigation throughout an economic lens. Issues such as price discrimination, tying, predation or unilateral effects, are all

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1 W. Blumenthal, Why Bother?: On Market Definition under the Merger Guidelines, Statement before the FTC/DOJ Merger Enforcement Workshop, Washington DC (February 17, 2004).

2 The term ‘antitrust’ is derived from U.S. law, generally referring to the protection of trade and commerce from unlawful restraints. In Europe, the notion of antitrust commonly depicts non-merger analysis under Article 81 and 82 EC. Additionally, the term antitrust is commonly used interchangeably with the term ‘competition law’, as is done throughout this book.

3 S. Bishop and M. Walker, *Economics of E.C. Competition Law: Concepts, Application and Measurement*, Sweet and Maxwell (2nd ed., 2002), at 2.

derived from economic theory, whilst at the same time constituting part of the legal discourse.

In particular, economics is indispensable to the competitive assessment in several ways:<sup>4</sup> economics may provide a normative yardstick for the execution of competition policy. It may aid to elucidate the meaning of various legal concepts applied in competition law, as well as structuring the relevant issues and rendering one's analysis more precise. It facilitates the assessment of the conflicting interests and provides valuable insights into the effects of various market structures, firms' incentives and conduct and the efficiency or welfare effects associated with these outcomes. Furthermore, economics may answer important questions of evidence, thereby adding accuracy to the legal analysis. Economic expertise can be therefore utilised to judge the plausibility of different legal settings, to predict the behaviour of market players and to underlie the conditions that must be met in order to fulfil a certain legal requirement, pertinent to the case at hand.

In fact, in few other domains of law are economic considerations as prominent in the legal discourse as in competition law. This was aptly recognised by Judge Bork, who noted on the dependency between economics and antitrust:<sup>5</sup>

“To those who object that economics is not a sufficiently certain discipline upon which to rest major policy conclusions, the answer given here is not (though it could be) that they misunderstand the nature and strength of the theory, but rather that such reliance is inevitable. There is no body of knowledge other than conventional price theory that can serve as a guide to the effects of business behaviour upon consumer welfare. To abandon economic theory is to abandon the possibility of a rational antitrust law”.

Conformity of competition law with economic principles was recognised by former Competition Commissioner Mario Monti, who asserted that “a major trend of this mandate has been to ensure that competition policy is fully compatible with economic learning”.<sup>6</sup>

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4 R.J. Van den Bergh and P.D. Camesasca, *European Competition Law and Economics, A Comparative Perspective*, Sweet & Maxwell (2<sup>nd</sup> ed., 2006), at 4.

5 R.H. Bork, *The Antitrust Paradox*, Basic Books (1978), at 117. Judge Posner has even gone so far as to suggest that “at the beginning of its second century, antitrust law has become a branch of applied economics”. See R.A. Posner, *The Problematics of Moral and Legal Theory*, Belknap Press of Harvard University Press (2000), at 229.

6 Mario Monti, *A Reformed Competition Policy: Achievements and Challenges for the Future*, Speech, Center for European Reform, Brussels (October 28, 2004). See also Mario Monti, *Convergence in EU-US Antitrust Policy Regarding Mergers and Acquisitions: An EU Perspective*, Speech, UCLA Law First Annual Institute on U.S. an EU Antitrust Aspects of Mergers and Acquisitions, Los

Along similar lines Philip Lowe, Director General for Competition of the European Commission, has recently expressed the need for a more economic approach to competition law enforcement.<sup>7</sup>

Several reforms in various areas of competition policy emphasise this trend. In 1997, the Commission promulgated its Notice on the definition of the relevant market,<sup>8</sup> which attempted to reformulate the market definition exercise in economic as well as empirical terms. The Notice introduced an economic framework, the SSNIP test, to govern the assessment of market boundaries<sup>9</sup>, together with a number of quantitative techniques aimed at aiding the definition procedure and enhancing its accuracy. Subsequently, the key position of economic considerations in competition law has been re-enforced with the revision of the Regulation governing vertical restraints in 1999,<sup>10</sup> and the publication of Guidelines on Horizontal Cooperation in 2001.<sup>11</sup> Further attempts to facilitate the penetration of economic methodologies into the legal practice are manifested in numerous expert reports,<sup>12</sup> commissioned with the aim of improving the quality of antitrust enforcement policy. Whilst encompassing a broad spectrum of prominent antitrust issues – vertical and conglomerate mergers, mergers with differentiated products, tacit collusion and unilateral effects – these reports provide an extensive overview of economic theory and respective issues of measurement. Finally, as part of the ‘more economic approach’ to merger control,<sup>13</sup> the Commission revisited its central instrument of EU competition

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Angeles (February 28, 2004), maintaining that the “focus on ensuring that competition enforcement in Europe is grounded in sound economics is one that I cannot over-emphasise”.

- 7 Philip Lowe, Director General, DG Competition, European Commission, *A More Economic Approach to Competition Law Enforcement – Making it Operational*, Presented in CRA International Annual Conference, Economic Developments in European Competition Policy, Brussels (December 15, 2005). For an overview of the ‘more economic approach’ see A. Christiansen, *The Reform of EU Merger Control – Fundamental Reversal or Mere Refinement?* (2006) (forthcoming in *Antitrust Policy Issues*, Hauppauge (F.H. Columbus Ed.)).
- 8 Commission Notice on the Definition of the Relevant Market for the Purposes of Community Competition Law, OJ C 372/5 (1997) (hereinafter: “1997 Notice”).
- 9 Albeit accompanied by remnants of the traditional legal approach to market definition, elaborated in Chapter 3.
- 10 Commission Regulation (EC) No 2790/1999 on the Application of Article 81(3) of the Treaty to Categories of Vertical Agreements and Concerted Practices, OJ L 336/21 (1999).
- 11 Commission Notice, Guidelines on the Applicability of Article 81 of the EC Treaty to Horizontal Cooperation Agreements, OJ C 3/2 (2001).
- 12 J. Church, *The Impact of Vertical and Conglomerate Mergers on Competition*, Report for DG Competition, European Commission (2004); R.J. Epstein and D.L. Rubinfeld, *Effects of Mergers Involving Differentiated Products*, Technical Report for DG Competition, European Commission (2004); M. Ivaldi, B. Jullien, P. Rey, P. Seabright and J. Tirole, *The Economics of Tacit Collusion*, Report for DG Competition, European Commission (2003); M. Ivaldi, B. Jullien, P. Rey, P. Seabright and J. Tirole, *The Economics of Unilateral Effects*, Report for DG Competition, European Commission (2003).
- 13 This term is sometimes used to refer to the recent reform process implemented by the European Commission between 2001 and 2004, aimed at improving the economic foundations of its assessment of mergers. For an overview of the initiated regulatory and organizational changes, see A. Christiansen,

policy, the merger regime, and issued its New Merger Regulation.<sup>14</sup> The new SIEC test (significant impediment to effective competition) to appraise mergers is closely aligned with modern industrial organization theory, and increases the scope for effects-based merger analysis. Likewise, the newly promulgated Horizontal Merger Guidelines<sup>15</sup> recognise the positive role of efficiencies,<sup>16</sup> potentially also inspiring the ongoing review of Article 82.<sup>17</sup>

Given the steady growth in economic inputs, it may be useful to consider the determinants driving this process. In particular, several factors are generally thought to contribute to the closer convergence between legal and economic principles in current antitrust analysis. First, realising economic benefits of competition policy occupies nowadays an essential part of the top-European agenda. Competition policy is perceived as an important tool in promoting growth and productivity and achieving economic prosperity for European citizens. As recently maintained by Commissioner Neelie Kroes:<sup>18</sup>

“I am convinced that competition policy is of fundamental importance for the future of the partnership for growth and jobs. We have already put in place a European Single Market, and many barriers to trade and growth have been abolished. Europeans are rightly proud of this unique achievement. However, if Europe is to achieve its full potential for growth, we need to make sure that the Single Market

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The “More Economic Approach” in EU Merger Control – A Critical Assessment, Deutsche Bank Research, research note 21 (March 1, 2006). However Lars-Hendrik Roller, former Chief Competition Economist, recently disputed the use of the term “more economic approach” to characterise the ongoing changes in the role of modern economic analysis, maintaining: “The question for effective enforcement is not one of “more” or “less” economics, but rather what kind of economics and especially how the economic analysis is used – or indeed sometimes may be abused – in the context of guidelines or cases. The change in the practice of European competition policy is all about the way in which economic principles and economic evidence are brought to bear in the context of decision making”. See L.H. Roller, Economic Analysis and Competition Policy Enforcement in Europe. Available at: [http://ec.europa.eu/dgs/competition/officechiefecon\\_ec.pdf](http://ec.europa.eu/dgs/competition/officechiefecon_ec.pdf).

- 14 Council Regulation (EC) No 139/2004 on the control of concentrations between undertakings, OJ L 24/1 (2004). As was recently articulated by Competition Commissioner Neelie Kroes, Building a Competitive Europe – Competition Policy and the Relaunch of the Lisbon Strategy, Speech, Milan (February 7, 2005): “Europe now has in place a mature merger control system, based on sound economics and the same standards as all major global jurisdictions”.
- 15 Guidelines on the Assessment of Horizontal Mergers under the Council Regulation on the Control of Concentrations between Undertakings, OJ C 31/5 (2004) (hereinafter: “EC Horizontal Merger Guidelines”).
- 16 In addition to efficiencies, the EC Horizontal Merger Guidelines also recognise buyer power, market entry and the “failing firm” defence as countervailing factors, which can, under certain circumstances, offset the increase in market power caused by the merger.
- 17 Philip Lowe, Director General, DG Competition, European Commission, Preserving and Promoting Competition: A European Response, Speech, St Gallen Competition Law Forum, St Gallen (May 11, 2006).
- 18 Neelie Kroes, Effective Competition Policy – A Key Tool for Delivering the Lisbon Strategy, Speech, Brussels (February 3, 2005).

provides an environment which rewards those businesses which innovate, which invest in research and development, which deliver better quality products at lower prices.

That is the role of competition. Competition drives competitiveness, growth and productivity. An effective, well-managed competition policy is both a pre-requisite and a key tool for delivering the Lisbon agenda”.

In order to preserve its significant role, competition law needs to be founded on solid economic grounds. Whilst legal reasoning alone, as a basis for competition decisions, is probably insufficient to ensure that competition enforcement powers remain intact, economics can provide an appropriate yardstick for executing competition rules and justifying policy measures to the European Community.<sup>19</sup>

Second, on several instances the European Court of Justice has forcefully invoked weaknesses in the European Commission’s consideration of economic arguments as well as its poor handling of evidence, to demand greater economic rigour. In three instances, *Airtours*,<sup>20</sup> *Schneider/Legrand*<sup>21</sup> and *Tetra Laval*,<sup>22</sup> the CFI declared Commission decisions void, heavily criticising the Commission for failing to appropriately prove its economic theories. The Commission’s unsound substantive analysis has thus lead to annulment of its decisions to prohibit these mergers. The court further reprimanded the Commission, stating:<sup>23</sup>

“It follows from all of the foregoing that the contested decision does not establish to the requisite legal standard that the modified merger would give rise to significant anti-competitive conglomerate effects. In particular, it does not establish to the requisite legal standard that any dominant position would be created on one of the various relevant PET packaging equipment markets and that Tetra’s current position on the aseptic carton markets would be strengthened. It must therefore be concluded that the Commission committed a manifest error of assessment in prohibiting the modified merger on the basis of the evidence relied on in the contested decision relating to the foreseen conglomerate effect”.

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19 L.H. Roller and P.A. Buigues, *The Office of the Chief Competition Economist at the European Commission*, Chief Competition Economist (2005).

20 Case T-342/99 *Airtours v. Commission*, (2002) ECR II-2585.

21 Case T-310/01 *Schneider v. Commission*, (2002) ECR II-4071.

22 Case T-5/02 *Tetra Laval v. Commission*, (2002) ECR II-4381. See also Case T-310/01 *Schneider v. Commission*, (2002) ECR II-4071, at para. 411: “The errors of analysis and assessment found above are thus such as to deprive of probative value the economic assessment of the impact of the concentration which forms the basis for the contested declaration of incompatibility”.

23 Case T-5/02 *Tetra Laval v. Commission*, (2002) ECR II-4381, at para. 336.

Third, with the emergence of the global market and its multi-national players, the European Commission is called for closer co-operation with other antitrust authorities, particularly with respect to its U.S. counterpart. Lack of co-ordination in the application of competition principles across jurisdictions carries the risk of weakening consistency and tractability of competition analysis, hence hindering the operation of transatlantic firms. It may further result in spillovers from a specific jurisdiction to an adjacent one, if the latter differs in its regulatory measures.<sup>24</sup> The highly disputed Commission decision to block the 2001 merger between *GE* and *Honeywell*, which had been cleared by U.S. antitrust authorities, exemplifies this concern.<sup>25</sup> Economic integration is therefore of the utmost importance in minimising international conflicts concerning antitrust enforcement, most notably in the field of merger control.<sup>26</sup> Within the European Community, the issue of co-ordination among decision-makers is further reinforced with the newly promulgated Council Regulation 1/2003, which grants a comprehensive role and broader judicial discretion to national competition authorities and Member States' courts to enforce and apply the Community competition rules.<sup>27</sup> Given the simultaneous competence of European and national competition authorities, the need to establish co-operation within the network of competition authorities, and a European-wide coherent antitrust policy, evidently presents itself.<sup>28</sup>

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- 24 As pointed out by W. J. Kolasky, ex-Deputy Assistant Attorney General at the U.S. Department of Justice: "First, in cases involving mergers in global markets, there are serious externalities associated with one jurisdiction blocking a merger on the basis of theories that other jurisdictions believe risk sacrificing important efficiencies to prevent speculative future harm to competition. By so doing, that jurisdiction denies consumers around the world the benefits the merger might have delivered. Second, divergent substantive standards between the U.S. and Europe are almost certain to increase the transactions costs associated with the merger clearance process. The result may well be to deter mergers that would have been pro-competitive and efficiency-enhancing. Third, such a sharp divergence undermines the strong political consensus supporting vigorous antitrust enforcement, something none of us wants". See W.J. Kolaski, *Conglomerate Mergers and Range Effects: It's a Long Way from Chicago to Brussels*, Speech before the George Mason University Symposium, Washington DC (November 9, 2001).
- 25 B.C. George, L.V. Dymally and K.A. Lacey, *Increasing Extraterritorial Intrusion of the European Union Authority into U.S. Business Mergers and Competition Practices: U.S. Multinational Business Underestimate the Strength of the European Commission from G.E.-Honeywell to Microsoft*, 19 *Connecticut Journal of International Law* 571 (2004); C. Veljanovski, *EC Merger Policy after GE/Honeywell and Airtours*, 49 *Antitrust Bulletin* 153 (2004).
- 26 D.J. Neven and L.H. Roller, *On the Scope of Conflict in International Merger Control*, 3 *Journal of Industry, Competition and Trade* 235 (2003).
- 27 Council Regulation 1/2003 on the Implementation of the Rules on Competition Laid Down in Articles 81 and 82 of the Treaty, OJ L 1/1 (2003).
- 28 For the reforms of competition law enforcement brought about by regulation 1/2003 see Van den Bergh and Camesasca (2006), op. cit., at 333-345, 402-446; W. Wils, *Principles of European Antitrust Enforcement*, Hart (2005); V. Korah, *An Introductory Guide to EC Competition Law and Practice*, Hart (2004), at Chapter 7; A. Jones and B. Sufrin, *EC Competition Law Text, Cases and Materials*, Oxford (2004), at 1050-1054.

Fourth, competition practice worldwide currently features a clear inclination for economic inputs, and dedicated empirical work is applied with rising frequency.<sup>29</sup> Economists are increasingly involved in competition law proceedings, and economic evidence is being accepted by the courts to a greater degree. In the U.K., for example, the annual turnover of the main economic consultancy firms has been multiplied by a factor of 20 since the early 1990s, representing approximately 15% of the aggregate fees earned on antitrust cases, a proportion close to that in the U.S..<sup>30</sup> A good illustration is found in the important *General Electric/Instrumentarium*<sup>31</sup> and *Oracle/PeopleSoft*<sup>32</sup> cases, which concerned post-merger unilateral effects in bidding markets. In both cases, the parties made use of distinguished economic consultants – namely RBB Economics for General Electric and NERA Economic Consulting for the competitor Philips, and respectively Lexecon for the bidder Oracle – who submitted extensive win/loss bidding studies to contest the Commission’s analysis of substitution patterns. Additional examples for the key position of economic analysis are the *Nestle/Perrier*,<sup>33</sup> *Kimberly-Clark/Scott*,<sup>34</sup> as well as *Procter & Gable/VP Schickedanz*<sup>35</sup> cases, addressed later in this book. As was recently affirmed by one antitrust practitioner, “The modern competition lawyer needs antitrust economics in his or her toolkit”.<sup>36</sup>

Moreover, economic expertise is also beginning to manifest itself among antitrust officials. In fact the Antitrust Division of the U.S. Department of Justice has been consistently employing professional economists of the highest standing already since 1989.<sup>37</sup> In Europe, Commissioner Mario Monti – an economist on his own account (albeit not an industrial economist) – appointed Lars-Hendrik Roller, a well-known professor of Economics, as the first Chief Competition Economist in 2003.<sup>38</sup> He further established the Chief Economist’s Office consisting of 10 specialised economists, to support DG Competition

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29 D.S. Evans and C. Grave, *The Changing Role of Economics in Competition Policy Decisions by the European Commission during the Monti Years*, 1 *Competition Policy International* 133 (2005), at 135-136.

30 D. J. Neven, *Competition Economics and Antitrust in Europe*, 21 *Economic Policy* 741 (2006).

31 Case COMP/M.3083 GE/Instrumentarium, (2004) OJ L 109/1.

32 Case COMP/M.3216 Oracle/PeopleSoft, (2005) OJ L 218/6.

33 Case IV/M.190 Nestle/Perrier, (1992) OJ L 356/1.

34 Case IV/M.623 Kimberly-Clark/Scott, (1996) OJ L 183/1.

35 Case IV/M.430 Procter & Gamble/VP Schickedanz (II), (1994) OJ L 354/32.

36 M. Willimans, *NERA Economic Consulting, Antitrust Economics*, Presented at the University of Oxford Centre for Competition Law and Policy, Oxford (October 18, 2004). See also A.I. Gavil, *After Daubert: Discerning the Increasingly Fine Line between the Admissibility and Sufficiency of Expert Testimony in Antitrust Litigation*, 65 *Antitrust Law Journal* 663 (1997), maintaining at 666: “Litigating an antitrust case absent the aid of an economist has become an increasingly perilous proposition”.

37 Including Robert Willig, Janusz Ordovery, Richard Gilbert, Carl Shapiro, Daniel Rubinfeld, Timothy Bresnahan, Joseph Farrell, Michael Katz David Sibley and Dennis Carlton.

38 Professor Roller was succeeded by Damien Neven, who currently occupies the Chief Competition Economist position.

law investigations. By strengthening the expertise of its competition practitioners, the European Commission has signalled an institutional commitment to economic analysis, and undertook an essential step towards formalising the use of economics in EC competition policy.<sup>39</sup>

Fifth, several improvements on the supply-side of economic analysis have facilitated these transitions. On the one hand, computer technology has made empirical analysis feasible and inexpensive. Processing and analysing large volumes of quantitative data has therefore become a rapid and accessible task. Moreover, data on commercial transactions, used by antitrust enforcement agencies and private parties in antitrust cases, is highly available thanks to supermarket scanner data collected by Nielsen and Information Resources Inc. (IRI). On the other hand, industrial organisation economists have extended the range of economic methodologies that could be utilised in antitrust practice.<sup>40</sup> Coinciding with the increasing interest in, and greater demand for, economics in competition policy, these technical and theoretical developments have made competition analysis amenable to economic reasoning.<sup>41</sup> Hence, whereas the Commission was originally only required to sporadically address econometric evidence when submitted by merging parties,<sup>42</sup> statistical and econometric methods have gradually penetrated everyday legal practice, sometimes even on the Commission's own initiative.<sup>43</sup>

As a final observation, whilst EU competition policy has ostensibly begun to interact more heavily with economic theory, it does not yet match the long-standing history and tradition of economic analysis in U.S. case law. The U.S. was the first legal system to adopt 'modern' competition laws, dating back to the 19<sup>th</sup> century and the enactment of the Sherman Act in 1890, which is still in force. Consequently, American antitrust lawyers and economists have immensely inspired other competition law jurisdictions throughout the world,<sup>44</sup> including the EU. Moreover, antitrust enforcement in the U.S. has been engaged in a tempestuous

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39 Note, however, that compared with the economic resources invested by private parties in antitrust litigations, the amount of resources mobilised by the DG Competition for economic analysis remains scant. See Neven (2006), *op. cit.*, at 751-752.

40 Deutsche Bank Research (2006), *op. cit.*, at 11.

41 J.B. Baker and D.L. Rubinfeld, *Empirical Methods in Antitrust Litigation: Review and Critique*, 1 *American Law and Economics Review* 386 (1999), at 386-387.

42 Interest in empirical analysis was probably prompted by the first EU merger control legislation, which was introduced in 1990. See L. Wu, P. Hofer and M. Williams, NERA Economic Consulting, *The Increasing Role of Empirical Methods in European Merger Enforcement: Lessons from the Past and a Look Ahead*, Paper prepared for the UCLA Law First Annual Institute on U.S. and E.U. Antitrust Aspects of Mergers and Acquisitions, Los Angeles, California (February 28, 2004), at 3.

43 One notable example is Case COMP/M.3625 Blackstone/Acetex, (2005) OJ L 312/60 (notified under document number C (2005) 2672), discussed in detail at Chapter 5.

44 Jones and Sufrin (2004), *op. cit.*, at 18.



interaction with legal and economic academic circles and private practitioners – attracting a broad range of commentaries and critics – for much longer than the EU competition rules established by the 1957 EC Treaty, pertaining of course also to the role of economics.<sup>45</sup> U.S. antitrust has been critically revolutionised in the 1970s and 1980s under the so-called Chicago School of thought, which largely shaped the fundamental principles of U.S. antitrust policy to date.<sup>46</sup> European competition policy, “seems to have leapfrogged the stage of learning from Chicago Economics”,<sup>47</sup> in particular its emphasis on economic efficiency as the ultimate goal of antitrust.<sup>48</sup> As the European Commission typically promotes several different and sometimes conflicting objectives,<sup>49</sup> including market integration, the protection of consumer welfare through low prices, efficiency savings, promotion of innovation and protection of small competitors, its commitment to economic analysis as the hallmark of antitrust law may be lessened.

Moreover on a practical level, considerable discrepancy still exists in the resources dedicated to economic analysis by the two competition authorities. The Antitrust Division of the DOJ and the FTC collectively occupy well over 100 professional economists,<sup>50</sup> compared to the much smaller and newly constructed team of specialised industrial organisation economists at DG Competition.

Notwithstanding the above disparities, and in light of the ongoing process of modernising European competition laws, it is expected that the Commission would continue to move toward positing economic analysis as one of its primary objectives. As cogently asserted by Commissioner Kroes in the latest European Commission’s Annual Report on Competition Policy, “building on the 2004

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45 G. Niels and A. Ten Kate, Introduction: Antitrust in the U.S. and EU – Converging or Diverging Paths?, 49 *Antitrust Bulletin* 1, 17 (2004).

46 *Id.*, at 9-10. See generally W. E. Kovacic, The Antitrust Paradox Revisited: Robert Bork and the Transformation of Modern Antitrust Policy, 36 *Wayne Law Review* 1413 (1990). Most recently, the U.S. Antitrust Modernization Commission comprehensively reviewed over three years U.S. antitrust laws, in order to determine whether it should be modernized. See Antitrust Modernization Commission, Report and Recommendations (April 2, 2007). Available at: [http://www.amc.gov/report\\_recommendation/amc\\_final\\_report.pdf](http://www.amc.gov/report_recommendation/amc_final_report.pdf).

47 Niels and Ten Kate (2004), *op. cit.*, at 16.

48 In fact Judge Posner, in the second edition of his treatise *Antitrust Law* has concurred that U.S. antitrust is now based on an Economic Approach: “The first addition of this book, published a quarter of a century ago, bore the subtitle “An Economic Perspective”, implying there were other perspectives. The implication was spelled out in the preface, where I announced that the purpose of the book was to expound and defend the economic approach to antitrust law. In the intervening years, the other perspectives have largely fallen away, a change that I have marked by dropping the subtitle from this new edition”. See R.A. Posner, *Antitrust Law*, University of Chicago Press (2d ed., 2001), at vii.

49 Velhanovski (2004), *op. cit.*, at 162-163; Van den Bergh and Camesasca (2006), *op. cit.*, at 5-6.

50 D.J. Neven (2006), *op. cit.*, at 751-752.

reforms, we are continuing to work on developing antitrust policy on a sound economic footing”.<sup>51</sup>

## 1.2 The Economics of Market Definition

European competition policy is concerned crucially with maintaining effective competition in the marketplace, and curbing the possible inefficiencies resulting from the exercise of market power. These economic concerns are typically translated in legal practice into a structuralist analysis that attributes key significance to market shares and concentration, and commences with a definition of the relevant antitrust market. Market definition plays a critical role in most EC competition law inquiries, as a necessary prerequisite and often the centre-piece of any investigation into the nature of competition in a given industry. The main function of market definition is to identify in a systematic way the competitive pressures and constraints faced by the firms involved. Those may include products and services which are, or can potentially be, close substitutes for one another in the eyes of consumers, such that they are able to restrain the behaviour of their suppliers.

The focal position of market definition in legal practice was explicitly recognised in decisions of the European Court of Justice and the Court of First Instance, which have established the need to define the relevant market for all substantive competition law provisions. It will not be possible to find an infringement of Article 81 and to ascertain alleged restrictions on competition, in the absence of a delineated relevant market.<sup>52</sup> Similarly, findings of abuse of dominance under Article 82 can be verified only against a particular market definition.<sup>53</sup> In the field of merger control, market definition is necessary to assess a merger’s future impact on the market. Whether the merger might significantly impede effective competition within the market, in particular as a result of the creation or strengthening of a dominant position,<sup>54</sup> requires that the relevant market is first-and-foremost defined.<sup>55</sup> The definition of the relevant market is hence “of essential significance, for the possibilities of competition can only be judged in relation to those characteristics of the products in question by virtue of which

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51 European Commission, 2005 Annual Report on Competition Policy, at 4.

52 Cases T-374/94, T-375/94, T-384/94 and T-388/94, *European Night Services v. Commission*, (1998) ECR II-3141, at para. 93.

53 J. Stuyck, M. Waelbroeck, B.L.P. van Reeken and S.B. Noë, *Competition Law in the EU and the Netherlands A Practical Guide*, W.E.J. Tjeenk Willink (2000), at 81.

54 EC Horizontal Merger Guidelines, at para. 1 and 4.

55 *Id.*, at para. 10. See also Case T-342/99 *Airtours v. Commission*, (2002) ECR II-2585, at para. 19.

those products are particularly apt to satisfy an inelastic need and are only to a limited extent interchangeable with other products”.<sup>56</sup>

The now-standard approach for defining relevant markets and identifying market power is an economic one, enquiring whether a hypothetical monopolist controlling a group of products would find it profitable to raise the price above the prevailing level. Recognising that the market definition question can be answered sensibly only by means of quantitative measures, the European Commission 1997 Notice on the definition of the relevant market states:<sup>57</sup>

“The question to be answered is whether the parties’ customers would switch to readily available substitutes or to suppliers located elsewhere in response to a hypothetical small (in the range 5% to 10%) but permanent relative price increase in the products and the areas being considered. If substitution were enough to make the price increase unprofitable because of the resulting loss of sales, additional substitutes and areas are included in the relevant market. This would be done until the set of products and geographical areas is such that small, permanent increases in relative prices would be profitable”.

The market identification process seeks thereto to recognise the smallest group of products and a geographical area, for which a hypothetical monopolist would find it profitable to increase prices for the foreseeable future, normally by five to ten percent. The examination starts with a narrowly defined set of products (or geographical areas), termed a candidate market, and includes at each stage the next best substitute, until a set of products worth monopolising is formed. The delineation of the relevant market is therefore brought into line with the SSNIP test approach to market definition, used under the U.S. Merger Guidelines,<sup>58</sup> and promotes more advanced insights of modern industrial organisation theories.<sup>59</sup>

Furthermore, the Notice registers several quantitative tests designed for the purpose of assessing the degree of substitution between products. Such tests

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56 Case 6/72 Europemballage Corp. and Continental Can Co. Inc.v. Commission, (1973) ECR 215, at para. 32.

57 1997 Notice, at para. 17.

58 U.S. Department of Justice and Federal Trade Commission Horizontal Mergers Guidelines, (1992 with April 8, 1997, Revisions to Section on Efficiencies), reprinted in 4 Trade Reg. Rep., Chicago, CCH (hereinafter: “U.S. Merger Guidelines”).

59 B. Bishop, The Modernisation of DGIV, Editorial, 18 European Competition Law Review 481 (1997); S. Baker and L. Wu, Applying the Market Definition Guidelines of the European Commission, 19 European Competition Law Review 273 (1998); P. Crocioni, The Hypothetical Monopolist Test: What it Can and Cannot Tell You, 23 European Competition Law Review 354 (2002); P.D. Camesasca and R.J. Van den Bergh, Achilles Uncovered: Revisiting the European Commission’s 1997 Market Definition, 47 Antitrust Bulletin 143 (2002).

“consist of various econometric and statistical approaches estimates of elasticities and cross-price elasticities for the demand of a product, tests based on similarity of price movements over time, the analysis of causality between price series and similarity of price levels and/or their convergence”.<sup>60</sup> With regards geographic market delineation, the Notice also points out to the analysis of trade flows and shipment patterns.<sup>61</sup> The Notice acknowledges the potential contribution of quantitative tools, and considers it a relevant evidence, to be employed regularly in market delineation exercises.

Given its central role in defining relevant markets, it may be necessary to understand what quantitative techniques are, and how exactly do they serve legal analysis. The terms ‘quantitative’ or ‘empirical’ methods commonly relate to the application of economic tools to test certain legal hypotheses concerning the nature of competition in the market under investigation. In fact, the use of economic tools in antitrust analysis has naturally emerged due to the need to answer many of its central questions which involve quantification.<sup>62</sup> Most notably, what products and geographical areas belong to the relevant market? How should market concentration and market shares be measured? What changes in price level are expected following a merger? To what degree may a transaction substantiate efficiencies? How responsive are potential entrants and fringe competitors to price changes in the relevant market?

Quantitative techniques range in their potential uses, their degree of sophistication, and the type of conclusions they may produce. For instance, observing price movements in two distinct regions and calculating the degree of statistical correlation between them may be informative in establishing whether two areas belong to a single relevant market. An application of shock analysis would seek to answer a similar question – whether two products or areas form part of the same market – albeit using different analytical means. Merger simulation models, on the other hand, hardly concern market definition, but rather allow the analyst to assess the likelihood of a post-merger price increase.

As a general matter, a robust application of quantitative techniques in a competition law context builds upon the existence of several elements.<sup>63</sup> First, the

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60 1997 Notice, at para. 39.

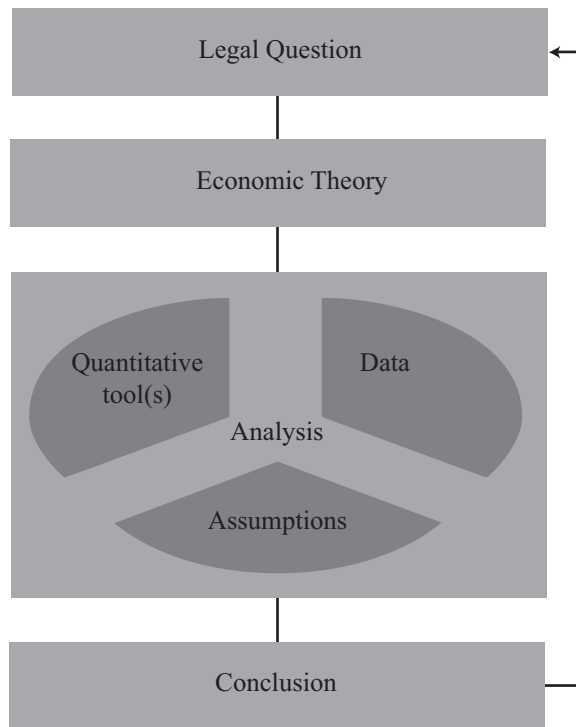
61 *Id.*, at para. 49.

62 LECG, *Quantitative Techniques in Competition Analysis*, Research Paper No. 17, Prepared for the Office of Fair Trading (1999), at 7-8.

63 NERA Economic Consulting, *The Role of Quantitative Analysis in Competition Assessments*, Federal Court/Law Council of Australia, Seminar on competition law (March 2005), at 3-10.

identification of a pertinent legal question such as would a contemplated merger lessen competition in the market? Second, an economic theory developed to explain why the undertaking's conduct may be found to infringe competition laws. Third, data, assumptions and quantitative tools which fit the case at hand would be deployed interdependently to address the postulated economic theory. Fourth, a conclusion has to be reached on whether the derived analytical results concur with the theory, and could be supported by other evidence. This process is illustrated in the figure below.<sup>64</sup>

**Figure 1.** Steps Required for Robust Quantitative Analysis



Quantitative techniques are increasingly being relied upon in competition proceedings. The promulgation of the 1997 Notice, reflecting the growing consensus over economic inputs in competition law, was intended to facilitate the entry of

64 Id., at 4.

the market definition exercise into the economic realm, and to promote more accuracy and predictability in this imperative phase of the competitive assessment. However, among legal practitioners, two typical misgivings may jeopardise the latter advancements.

One commonly raised concern towards empirical analysis is related to the availability of requisite data. In the absence of the ability to draw suitable data from the industry under investigation, empirical techniques can do very little to aid the analysis.<sup>65</sup> Data scarcity may cause a bias in the methodological choices. It may also dictate preference towards one technique over another, usually in the direction of the less sophisticated ones, possibly undermining the analytical rigour of the investigation. As EC competition law often has to rely on less available data, compared to that in the U.S.,<sup>66</sup> objections uttered on these grounds are often heard.

A second apprehension pertains to the aptitude of empirical methods to serve the competitive assessment usefully.<sup>67</sup> This categorical criticism may be colloquially formulated as ‘rubbish in; rubbish out’, relating to the inherent scepticism sometimes expressed by antitrust practitioners towards economic evidence in legal proceedings. Quantitative models, it has been argued, should be treated with caution, since they may hardly convey useful information concerning market outcomes, or predict actual players’ conduct.

Whether these claims have any merit is investigated in this book. Furthermore, this book aims to alleviate some of the eminent suspicion towards economic analysis still evident in competition law. As was concisely reckoned by some commentators, “market definition is ultimately an empirical question that should be answered through empirical analysis”.<sup>68</sup>

### **1.3 Research Question**

The aim of this project is to achieve better integration of industrial economics and competition law, by providing judges and lawyers with a cogent theoretical framework for the appraisal of antitrust markets and the measurement of market

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65 Bishop and Walker, *op. cit.*, at 6-7.

66 *Id.*, at 7; L. Coppi and M. Walker, *Substantial Convergence or Parallel Paths? Similarities and Differences in the Economic Analysis of Horizontal Mergers in U.S. and EU Competition Law*, 49 *Antitrust Bulletin* 101, 108 (2004). This can explain to a certain extent the strong EU adherence to price tests, for which data is more readily available, over more advanced empirical tools.

67 Bishop and Walker (2002), *op. cit.*, at 7.

68 Coppi and Walker (2004), *op. cit.*, at 110.

power, while indicating the relevant empirical evidence substantive to applying this framework in practice.

As the renowned dependency between law and economics in the field of antitrust intensifies, a correct application of the legal principles mandates a sound economic proficiency, not inevitably possessed by legal practitioners. In particular, a successful assimilation of economic-based approaches in the application of market definition hinges upon the fulfilment of two conditions. First, that the regulatory provisions utilised by the European Commission are aligned with the economic theory underpinning the definition of the relevant market. Second, that the Commission properly utilises all quantitative techniques available to date.

Thus, in order to fully appreciate whether European competition law practice is supported by the use of sound economic analysis, this book subscribes to the following research questions:

- (1) Is the more economic approach taken by the European Commission in conformity with theoretical economic insights on market definition?**
- (2) Do decisions in real-life cases under European competition law utilise all relevant empirical measures?**

Critical evaluation of the Commission's decision-making practice is crucial for both positive and normative levels of antitrust law, to ensure the efficiency of current competition policies, together with prospective ones.

The first issue of interest in this book is therefore the degree of harmony among legal and economic frameworks for the analysis of relevant antitrust markets. In this context, special attention is devoted to the 1997 Notice, in which the Commission seemingly pioneered an economic-based methodology to govern its market definitions. It will be examined to what extent the Notice truly accommodates economic principles, and what impediments, if any, may hamper its analytical rigour.

The second theme in this book is the proper application of quantitative tools in competition analysis. While the variety of empirical techniques has grown considerably in recent years, it is investigated to what extent the Commission aptly uses all applicable tools, whether quantitative techniques are routinely employed, and whether their use could be expanded or improved.

Finally, as the more economic approach to market definition reflects a global trend, the analysis is inherently a comparative one, and draws upon ongoing

developments in other jurisdictions – predominantly focusing on the most experienced and advanced legal system of the U.S. – to construct a comprehensive representation of how the legal prerequisite of market definition ought to be tackled.

## **1.4 Structure of the Book**

Law, economics, and their amalgamation in the making of antitrust markets are the three pillars on which this book rests. Chapters two and three are dedicated to the theoretical underpinnings of the market definition question, both in terms of its legal and economic foundations. The fourth chapter scrutinises quantitative techniques that may be employed to serve the delineation of the relevant market, their potential uses and misuses. The fifth chapter comprises an analysis of selected cases, reflecting the evolution in the Commission’s approach toward the market definition exercise, and the degree to which quantitative methodologies have infiltrated the legal discourse.

### **Chapter 2**

The economic foundations of European competition law, central to one of its most distinguished goals – the maintenance of effective competition and the elimination of possible inefficiencies associated with the exercise of market power – are the primary focus of this chapter. Fundamental economic concepts such as perfect competition, monopoly, oligopoly, and product differentiation are addressed herein.

Furthermore, this Chapter closely examines what are the indicators of market power, and how the latter could be defined and detected. In this context, the structure-conduct-performance paradigm, and its overwhelming influence on European decision-making, is discussed in detail. Whilst the SCP inspired the emergence of an indirect structuralist framework for assessing market power – consisting of an analysis of market shares and concentration, and the identification of barriers to entry – it also posited market definition at the starting point of almost any competition law investigation, and endowed it with its current key position.

### **Chapter 3**

This chapter centres on the practice of delineating the relevant market in European competition law. In particular, it deals with the prevailing legal approach to market definition as a primary tool for identifying market power, its history, scope, advantages, and the potential pitfalls associated with the latter exercise.



The emergence of the relevant market into a coherent methodology is typically credited to the U.S. legal practice, governed by its prominent Supreme Court precedents. Moreover, the U.S. Horizontal Merger Guidelines and their subsequent revisions offered, for the first time, a complete analytical framework for identifying and eliminating mergers that have the power to create or enhance market power. It is against this background that the European jurisprudence has progressively transformed market definition from a mere appraisal, and often a subjective one, of demand substitutes, into the SSNIP framework promulgated nowadays by the European Commission.

Following an historical overview underlying the development of this process, the chapter continues to portray the existing legal framework, while highlighting its potential advantages and drawbacks. Particular attention is dedicated to the 1997 EC Commission Notice on the definition of the relevant market, and its main provisions are introduced thereto. Finally, this chapter draws attention to some of the complications surrounding the legal methodology when applied to specific market definition problems, notably the application of the SSNIP test in monopolisation cases, and the issue of market definition in technologically-driven markets.

#### **Chapter 4**

Following the first chapters of this book, which explore the function and merits of market definition in the competitive assessment, this chapter moves on to investigate empirical techniques. These techniques are vested a considerable role in this process, as they provide an objective instrument to measure the strength of competition between products, and reduce the inherent dependence on parties' hypotheses or the need to rely on theoretical arguments and subjective judgments.

It is sometimes suggested that quantitative techniques require high quality data which is usually missing. Another often heard claim is that the better the data, the more complex and obscure the analysis becomes. To rebut these contentions, a wide array of techniques varying in their degree of sophistications is introduced and analysed in-depth. In general, all empirical tests employ data drawn from the market under investigation to test a certain hypothesis concerning the nature of competition. Hence, each technique in this chapter is examined on its merits, its strengths and weaknesses, together with a protracted elaboration on its application in competition law investigations. The techniques discussed range from a more straightforward analysis of prices and price trends, transport costs and shipment tests, to demand analysis, and different models of competition. Techniques dealt with are expressed both economically and intuitively, to enable clear guidance for both economic and non-economic

professionals. Moreover, the use of each technique is exemplified by relevant numerical examples or case law. As the discussion portrays, many quantitative techniques can be perceived and executed on a very intuitive level, requiring fairly rudimentary data and no preliminary expertise. As such, they can be understood and successfully implemented by a large audience.

Whilst addressing the empirical methods most frequently invoked by the European Commission, this chapter proffers a comprehensive account of nearly all quantitative methods utilised both in and outside the EU, to allow antitrust practitioners a thorough consideration of the economic tools available nowadays for defining antitrust markets.

## **Chapter 5**

This chapter asks whether EC competition law practice, as reflected throughout its decisions, constitutes a decision-making process that is in conformity with the economic insights drawn in the previous chapters. Whilst the Commission's 1997 Notice proclaims harmony with economic principles, there appears to be an observed dissonance between the traditional methods of market definition and the economic-based SSNIP framework for market definition.

In order to test the full impact of the economic approach on European decision-making, a distinct analysis of selected decisions is undertaken, to assess the extent to which market definition exercises exhibit sound economic reasoning. An additional question addressed here, in comparing recent decisions to older ones, is whether the 1997 Notice on market definition signified a genuine change in the Commission's approach, compared to its older 'traditional' practice.

The analysis proceeds chronologically to demonstrate the evolution of the Commission's handling of market definition, and covers among others the decision of the European Court of Justice in *United Brands* (better known as Chiquita bananas), which marks the early days of market definition and market power in the European discourse; *Nestle/Perrier*, which combines numerous quantitative techniques – most prominently price trends and shipment patterns – to deduce the degree of competition between bottled mineral water and soft drinks; *Kimberly-Clark/Scott*, which illustrates the use of demand elasticities to establish market boundaries, and the *Cruise Ships* merger investigation, which concerns the potential contributions of critical loss analysis.

**Chapter 6**

At the end of this journey, both research questions are reiterated: Is the European Commission's practice supported by a sound use of economic theory? Does the Commission utilise all relevant empirical measures in its decision-making process? In the final chapter I summarise the analysis undertaken throughout this book, assemble the findings of my investigation, and draw some general conclusions and recommendations for future competition analysis.



## Chapter 2

# Market Power

### 2.1 Introduction

Competition among firms is widely regarded as a crucial facet of social well-being. Markets that feature vigorous competitive dynamics tend to reach the most efficient allocation of resources and are thought to produce the greatest benefits to all members of society, generating lower prices and higher output, and promoting progress, innovation and total welfare. Monopolies, in contrast, are typically associated with stagnation, higher prices and lower welfare, and are therefore perceived as a source of concern. Consequently, competition policy is invoked in situations where the competitive environment in the marketplace is deemed threatened.

In particular, it is generally believed that the European Community should be based on the market economy principles, namely an economy in which market forces largely shape the competitive contours, the types of products that are bought and sold, as well as their price. These views are invariably related to the classic concept of a free market system introduced by Adam Smith,<sup>1</sup> by which the activities of independent undertakings, motivated by self-interest, guide economic development and create a competitive environment that confers long-term benefits in the form of lower prices and higher employment<sup>2</sup>.

Accordingly, European competition policy is primarily preoccupied with the maintenance and promotion of *effective competition*.<sup>3</sup> The notion of effective

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1 A. Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (1776).

2 C. Bellamy and G. Child, *European Community Law of Competition*, Sweet and Maxwell (5<sup>th</sup> ed., 2001), at 39-40. For the virtues and advantages of competition see also D.G. Goyder, *EC Competition Law*, Oxford (4<sup>th</sup> ed., 2003), at 8-9; M.M. Dabbah, *EC and UK Competition Law*, Cambridge (2004), at 2-5.

3 D. Hay and J. Vickers, *The Economics of Market Dominance*, In: D. Hay and J. Vickers (eds.), *The Economics of Market Dominance*, Blackwell (1987), at 2; A. Jones and B. Sufrin, *EC Competition Law* (2<sup>nd</sup> ed., 2004), at 2.

competition is central to EC competition law,<sup>4</sup> and can be interpreted as relating to the freedom and right of initiative of the individual economic operators within a certain industry,<sup>5</sup> although its exact meaning remains unclear.<sup>6</sup> Markets may be said to be subject to effective competition if a process of rivalry between undertakings takes place, if no firm is significantly restrained by its rivals, and if no individual firm can influence the market price.<sup>7</sup>

However, in European competition law discourse, it is customary to equate the maintenance of effective competition with the protection of consumer welfare.<sup>8</sup> As eloquently articulated by former Competition Commissioner Mario Monti:<sup>9</sup>

“the goal of competition policy, in all its aspects, is to protect consumer welfare by maintaining a high degree of competition in the common market. Competition

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- 4 For instance, Commission Notice, Guidelines on the Applicability of Article 81 of the EC Treaty to Horizontal Cooperation Agreements, OJ C 3/2 (2001), at para. 1.1, state: “The Commission, while recognizing the economic benefits that can be generated by cooperation, has to ensure that effective competition is maintained”. Likewise, Council Regulation (EC) 139/2004 on the Control of Concentrations between Undertakings, OJ L 24/1 (2004), refer at para. 23 to “the need to maintain and develop effective competition”, and establish at para. 25 the incompatibility of “A concentration which would significantly impede effective competition” with the common market. See also Guidelines on the Assessment of Horizontal Mergers under the Council Regulation on the Control of Concentrations between Undertakings, OJ C 31/3 (2004), at para. 1, maintains that the Commission must assess “whether or not a concentration would significantly impede effective competition, in particular as a result of the creation or strengthening of a dominant position”. Most recently, the Report on Competition Policy (2006) repeats the objective of “contributing to an overall economic policy framework across economic sectors that is conducive to effective competition”.
- 5 European Commission, XVth Annual Report on Competition Policy 1985. Along similar lines, the XXXIIIrd Report on Competition Policy 2003 upholds: “While safeguarding effective competition on the market, companies thus gain more freedom in taking commercial decisions”. For some clarifications over the definition of effective competition see S. Bishop and M. Walker, *The Economics of EC Competition Law: Concepts, Application and Measurement*, Sweet & Maxwell (2<sup>nd</sup> ed., 2002), at 13-16.
- 6 Bishop and Walker (2002), op. cit., at 12; C. Veljanovski, *EC Merger Policy after GE/Honeywell and Airtours*, 49 *Antitrust Bulletin* 153 (2004), at 178-179.
- 7 Bishop and Walker (2002), op. cit., at 13-16, 39-41.
- 8 Economists, however, would probably argue that the relevant criterion is total rather than consumer welfare. Importantly, the two welfare standards will often lead to equivalent policy measures, but not always. For example, perfect price discrimination reduces consumer welfare but maximises total welfare. Whether or not such practice should be banned depends, therefore, on the goals set by competition policy. For a discussion of consumer versus total welfare in legal and economic discourses see M. Motta, *Competition Policy*, Cambridge University Press (2004), at 19-22.
- 9 Mario Monti, *The Future for Competition Policy in the European Union*, Speech, Merchant Taylor’s Hall, London (July 9, 2001); Mario Monti, *Convergence in EU-US Antitrust Policy Regarding Mergers and Acquisitions: An EU Perspective*, Speech, UCLA Law First Annual Institute on U.S. an EU Antitrust Aspects of Mergers and Acquisitions, Los Angeles (February 28, 2004), maintaining that in both jurisdictions “the ultimate purpose of our respective intervention in the market-place should be to ensure that consumer welfare is not harmed”.

should lead to lower prices, a wider choice of goods, and technological innovation, all in the interest of the consumer”.

Along similar lines, the recent Guidelines on the Application of Article 81(3) EC Treaty refer to the need “to protect competition on the market as a means of enhancing consumer welfare”.<sup>10</sup>

Such elucidation of the objective underlying competition law makes clear that the maintenance of effective competition is heavily dependent on the absence of significant market power, or monopoly power.<sup>11</sup> In most instances, a firm cannot be found liable under competition rules unless it possesses some degree of market power. Consequently, eliminating market power and preventing its main inefficiencies is the fundamental focus of merely all competition law investigations.<sup>12</sup>

To fully comprehend the inherent intolerance towards dominant positions and the strong adherence to a structural mode of analysis, it may be useful to recall the intellectual origins of the so-called Ordoliberal ideas of the Freiburg School, which has played a significant role after the Second World War, and fundamentally dictated the development of economic policy and competition law in Europe, especially in Germany.<sup>13</sup> According to these views, individual freedom could be guaranteed only if restrictions to competition (manifested in the exercise of market power) would be prohibited. Economic freedom was hence conditioned upon the elimination of powerful economic institutions. The existence of a dominant position and its potential ability to abuse market participants implied, in turn, an anti-monopoly philosophy stressing the notion of fairness, which was perceived as protecting the individual economic freedom of action against any impairment caused by overly powerful single entities.

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10 Guidelines on the Application of Article 81(3) EC Treaty, OJ C 101/97 (2004), at para. 13.

11 Competition law commonly uses the terms “market power” and “monopoly power” interchangeably, with no precise distinction between them. Note, however, that whilst in economic theory monopoly implies the existence of only one firm in the market, in the legal writings a monopoly may mean a dominant producer, but not necessarily a single one.

12 On the role of competition law in correcting the undesirable effects of monopoly see R.J. Van den Bergh and P.D. Camesasca, *European Competition Law and Economics: A Comparative Perspective*, Sweet & Maxwell (2<sup>nd</sup> ed., 2006), at 27-29.

13 For a general overview see D.J. Gerber, *Constitutionalizing the Economy: German New-Liberalism, Competition Law and the “New” Europe*, 42 *American Journal of Comparative Law* (1994); D.J. Gerber, *Law and Competition in Twentieth Century Europe: Protecting Prometheus*, Clarendon Press (1998), at 232-265; S. Schmitz, *The European Commission’s Decision in GE/Honeywell and the Question of the Goals of Antitrust Laws*, 23 *University of Pennsylvania Journal of International Economic Law* 539 (2002); M. Gal, *Monopoly Pricing as an Antitrust Offence in the U.S. and EC: Two Systems of Belief about Monopoly?*, 49 *Antitrust Bulletin* 343 (2004), at 364-365; Van den Bergh and Camesasca (2006), *op. cit.*, at 65-67.

Proponents of the Freiburg School further regarded the existence of a legal order as essential to the protection of individual freedom against governmental intervention as well as private economic power. Such a system would rely on the legislature to regulate the economic activity in order to allow market players to compete vigorously, ('complete competition' or *vollständiger Wettbewerb*<sup>14</sup>). The representation of the Ordoliberal philosophy is apparent in the formulation of Article 82 EC, a provision which aims to shield competition from possible abuses exercised by a single firm possessing monopoly power, but permits the conduct when employed by non-dominant incumbents<sup>15</sup>.

As market power lies at the heart of most competition law inquiries as well as being the principal focus of competition law regimes, it is also the central focus of this chapter. The definition of market power prevalent in the economic literature tends to concentrate on the individual firm's pricing discretion above the competitive level. Market power is thereby defined as the ability of a firm or group of firms to raise price, throughout the restriction of output above the level that would prevail under competitive conditions, and thus enjoy increased profits from that action.

To understand this definition, some clarification of the relevant economic concepts is necessary.<sup>16</sup> The chapter therefore proceeds as follows. First, the two extreme economic models of perfect competition and monopoly are introduced and contrasted. Furthermore, the limited usefulness of the perfect competition model as a yardstick for competition law enforcement is highlighted. Second, the chapter examines the question of appraising market power in economic theory. To that end, the basic concepts underlying the measurement of market power, primarily demand elasticities, are presented and explained. Third, the chapter addresses the prevailing legal framework for the assessment of market power, one

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14 W. Eucken, *The Foundation of Economics: History and Theory in the Analysis of Economic Reality*, Hodge (1950).

15 Moreover, in contrast to its American counterpart (Section 2 of the Sherman Act), application of Article 82 requires no causal link between the contested conduct and the firm's market power, namely, the conduct under scrutiny need not maintain or strengthen the firm's dominant position. J. Vickers, *Abuse of Market Power*, 115 *The Economic Journal* F244-F247 (2005); T. Elimansberger, *How to Distinguish Good from Bad Competition under Article 82: In Search of Clearer and More Coherent Standards for Anti-Competitive Abuses*, 42 *Common Market Law Review* 129 (2005), at 140-146. See also *Case 322/81 Michelin v. Commission*, ECR 3461 (1983), at para. 57: "A finding that an undertaking has a dominant position is not in itself a recrimination but simply means that, irrespective of the reason for which it has a dominant position, the undertaking concerned has a special responsibility not to allow its conduct to impair genuine undistorted competition on the common market".

16 The scope of this book does not allow, however, for a complete representation of microeconomic theory. A profound examination of the relevant topics can be found at R.S. Pindyck and D.L. Rubinfeld, *Microeconomics*, Prentice Hall (6<sup>th</sup> ed., 2005).



which differs significantly from its economic counterpart. The legal discourse has developed an indirect structuralist approach comprising three steps, which cumulatively testify on the existence of market power, thereby avoiding its direct measurement. As the ensuing discussion illustrates, most competition law analyses pertaining to the nature of the interaction between firms within a certain industry reflect ascendancy of the latter methodology.

## **2.2 Economic Foundations of Competition Law Analysis**

### **2.2.1 Perfect Competition**

Intervention by competition authorities is believed justified when market conditions suppress competition and do not lead to an efficient outcome. It is more difficult to define, however, what this efficient outcome ought to be. Contemporary competition law practice typically invokes the perfect competition archetype, grounded in microeconomic theory, as the benchmark against which market operation is assessed. According to this textbook model, given the fulfilment of conditions, markets achieve utmost efficiency and social welfare is maximised, so that no further improvement is possible. Put differently, in perfectly competitive markets any intervention by competition authorities is redundant.

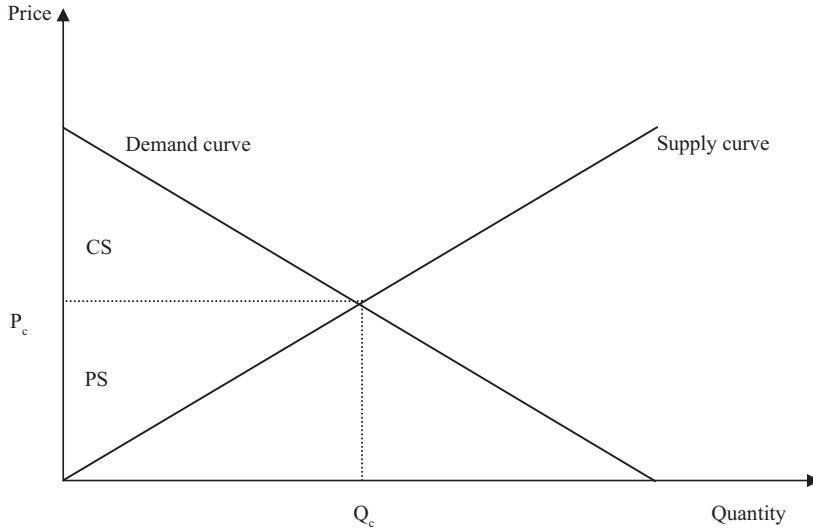
To ensure perfect operation and achieve the efficiency level predicted by the theory, a market should satisfy the following criteria:<sup>17</sup>

- A large number of buyers and sellers. Each firm controls a very small portion of the market, and operates at minimal costs.
- A homogeneous product.
- Perfect information of all buyers and sellers.
- No barriers to entry or exit.

As a result of this state of affairs, each seller in the market is insignificant when compared to the market as a whole. As illustrated by figure 1, the price is exogenously determined at the intersection of the aggregate supply and demand curves. Sellers are thus described as ‘price takers’, namely, they are unable to affect market price.

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17 Bishop and Walker (2002), *op. cit.*, at 17-21; Van den Bergh and Camesasca (2006), *op. cit.*, at 19-23.

**Figure 1.** Perfect Competition in an Industry

In figure 1, the downward-sloping line denotes the aggregate industry demand curve, which indicates how much of a product consumers are willing to buy at different prices. The lower the price, the higher the quantity demanded by consumers. The upward sloping line denotes the aggregate supply curve, which indicates the combinations of quantity offered by the firms operating in the industry corresponding to every possible price level.

The market mechanism, that is, the interaction between buyers and sellers, pushes prices up and down, according to shortage in demand or surplus in production, until a stable equilibrium is obtained. In equilibrium, the point where demand and supply meet, market price is set at  $P_c$ , and the quantity sold on the market is  $Q_c$ .<sup>18</sup>

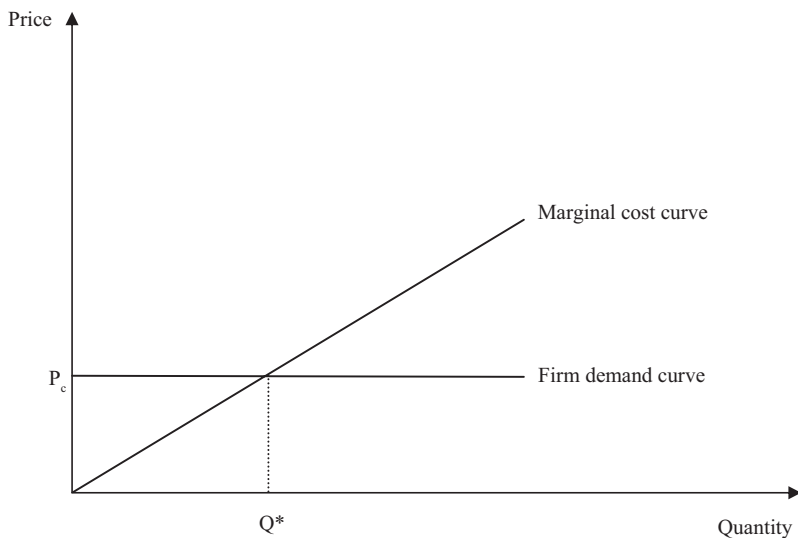
Furthermore, it can be shown that a perfectly competitive market leads to the utmost efficient equilibrium, where it is impossible to conceive a better outcome for society as a whole. At this price level and output level, social welfare, which comprises the sum of consumer surplus (CS) and producer surplus (PS), is maximised and no deadweight loss results.<sup>19</sup>

18 The concept of the equilibrium can be understood intuitively. As long as the market price exceeds the marginal cost of production, the firm will find it profitable to sell additional units. If, on the other hand, the price falls beyond the marginal cost, the firm is likely to restrict its output in order to cut losses. In a state of equilibrium, therefore, the price equals exactly the marginal cost for all sellers in the market.

19 In economic terms, the competitive equilibrium manifests allocative together with productive efficiency. Allocative efficiency is achieved when the existing goods are allocated through the

It should be recognised that the curves in figure 1 depict the situation in the industry, and differ from the curves faced by the individual firm. As noted above, under the assumptions of perfect competition, no single firm controls a sufficiently large portion of the market to affect market price. Consequently, whilst the demand curve for the entire market is downward sloping, the demand curve faced by each individual producer is horizontal. This situation is illustrated in figure 2 below.

**Figure 2.** Firm-Specific Curves under Perfect Competition



The upward-sloping line in figure 2 denotes the marginal cost of the firm producing the product, namely, the cost of producing one additional (i.e. incremental) unit of that product. The horizontal line denotes the market price  $P_c$ , which is determined independently in the market by the interaction of buyers and sellers, and is taken as given by each individual producer. Therefore, the only relevant decision taken by the firm relates to the choice of output to be

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price system to the buyers who value them most. Productive or technical efficiency implies that output is maximised by using the most effective combination of resources; hence, X-inefficiency or internal-slack is absent. Competitive markets are therefore said to be Pareto efficient, namely, it is not possible to improve the welfare of one individual without reducing the welfare of another. Antitrust enforcement is mostly concerned with promoting allocative efficiency, typically focusing upon short-term price competition, in line with the perfect competition model. It therefore tends to ignore a third form of efficiency – dynamic efficiency – which is not incorporated in the model, but is nonetheless thought to affect society's welfare greatly. For a discussion see J.F. Brodley, *Economic Goals of Antitrust, Consumer Welfare and Technological Progress*, 62 *New York University Law Review* 1020 (1987).

produced under the market price  $P_c$ . In order to maximise its profit, every firm in a perfectly competitive environment will produce at the output level  $Q^*$ . An important implication of the model is thus that in perfect competition, the market price equals the marginal cost of production.<sup>20</sup> Furthermore, as entry and exit are presumably free, the model predicts that no firm in the marketplace is able to charge a price higher than  $P_c$ , or to make a positive economic profit.<sup>21</sup>

### 2.2.2 Monopoly

At the opposite end of the spectrum and in sharp contrast to perfect competition lies the economic model of monopoly. The monopolist, a unique producer in the market, can be distinguished from competitive firms on several important grounds. Unlike perfect competition, whereby a large number of sellers operate in the market, a market structure of monopoly is characterised by the existence of one single producer of a product, who provides all the buyers in the market. The monopolist faces neither perfect nor even close substitutes to his product, and as such, is not challenged by any form of competition.<sup>22</sup>

The theory of monopoly predicts that when a single firm does not encounter any competitive constraints, it will set market price as high as it possibly can. In effect, the monopolist is constrained only by the demand he is facing. The higher the price, the fewer units will be desired by buyers in the market. The monopolist may obtain a very high price for selling one unit, but he may rather prefer selling several units at a lower per-unit price, if this will increase overall revenue. Hence, the monopolist's production decisions are based on the relationship between his marginal (per-unit) revenue, namely the additional revenue resulting from increasing production by one unit, and the marginal cost of producing that unit. If producing an additional unit will yield revenue too low to cover the extra cost of production, the monopolist will refrain from doing so.<sup>23</sup> Consequently, the general condition for monopoly pricing holds:<sup>24</sup>

$$(1) \quad MC = MR$$

where MC is the marginal cost of production, and MR is the marginal revenue.

20 Microeconomic theory dictates that profit maximisation occurs when marginal cost equals marginal revenue which, in perfect competition, equals also the market price. For a more detailed representation see Pindyck and Rubinfeld (2005), *op. cit.*, at Chapter 8.

21 Zero profits in economics do not mean zero accounting profits, but rather imply that firms earn the rate of return that makes them indifferent between staying in the market or not. *Id.*, at 283.

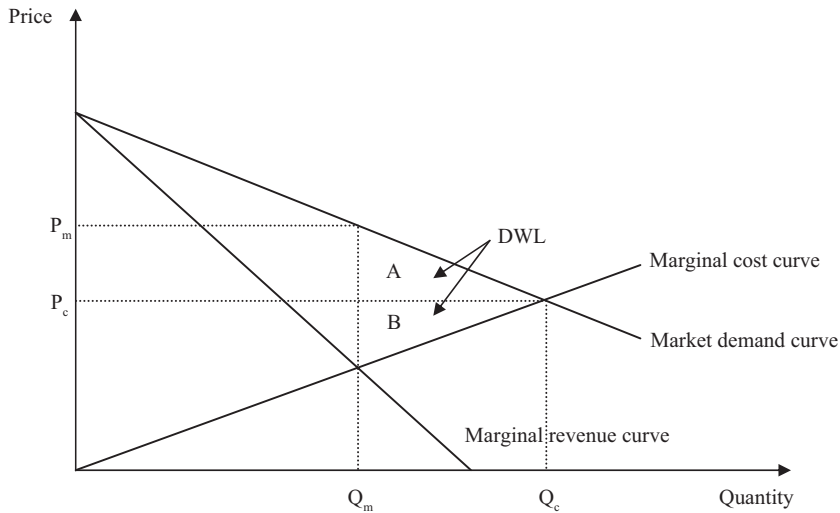
22 Such uncontested market position can only be explained by the existence of some barrier to entry. The issue is addressed below.

23 Bishop and Walker (2002), *op. cit.*, at 22, use a numerical example to illustrate the relationship between marginal revenue, marginal cost and the level of profits.

24 Pindyck and Rubinfeld (2005), *op. cit.*, at 342.

Applying this condition, the monopolist decides on the level of output that will maximise profits from production and sets the price respectively on the market demand curve he is facing. Figure 3 below summarises this process, whereby  $Q_m$  is the output chosen by the monopolist, and  $P_m$  is the price charged from consumers for every unit sold.

**Figure 3.** Monopoly



A first noticeable difference between perfect competition and monopoly concerns the shape of the demand curve. Whereas producers in perfectly competitive markets are facing a horizontal demand curve, the monopolist – being a unique producer – controls the entire market demand. Facing a downward sloping demand allows the monopolist to independently determine the market price, and to set the price in excess of marginal cost. An important implication of the model is, therefore, that the monopolist's price will generally exceed the price under perfect competition (i.e. the marginal cost), whereas the level of output will be lower.

This power of an individual firm to restrict output and to price above the competitive level is termed *market power*. The competitive price level is used as the benchmark for the existence of market power, and firms that are able to set the price higher than this level (namely firms that do not face a horizontal demand curve) are said to possess market power.

Both economic theory and competition law analysis view market power as a negative phenomenon, since it is associated with a decrease in social welfare. The monopoly pricing decision leads to a transfer of wealth from consumers to producers, as well as to a social waste resulting in the misallocation of resources. The area DWL in figure 3 represents the dead weight loss, or the wasted resources caused by the monopolist's restriction of output and excessive price, when compared with perfect competition. This area generally consists of two types of losses: a loss of consumer welfare (depicted by area A) and a loss of producer welfare (depicted by area B). Whereas in perfect competition consumer welfare consisted of the area between the demand curve and the market price  $P_c$ , the monopoly production contracted this surplus to the area between the demand curve and the monopoly price  $P_m$ . The forgone consumer surplus was partly seized by the monopolist and partly wasted, thereby inflicting a social cost. Similarly, producer surplus in a perfectly competitive market amounted to the area between the marginal cost curve and the market price  $P_c$ . However, the monopoly pricing changed this surplus into the area between the cost of production and the price  $P_m$ , thereby causing the loss of area B.<sup>25</sup>

As the dead weight loss implies a loss of efficiency and reduction in social welfare, a primary goal of competition law regimes is to reduce and eliminate market power, and to maintain an effective process of competition.

### 2.2.3 Competition in the Real World

It is widely acknowledged that the model of perfect competition can only be found in microeconomic textbooks. In reality, the rigid assumptions introduced by the model are seldom fulfilled, and most real markets substantially depart from its confined scope. In particular, products in most industries are not homogeneous but rather differentiated; exit and entry into markets are seldom free due to certain cost conditions or regulatory barriers; information is asymmetric and transaction costs considerable, and the number of buyers and sellers is definite and sometimes restricted. Moreover, the perfect competition paradigm is fundamentally static, focusing upon price and quantity but overlooking other factors that may generate social surplus, for instance innovation. As such, it is capable of conveying, at best, a partial presentation of the competitive environment.<sup>26</sup>

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25 It should be noted that such welfare analysis is inherently static as it presupposes homogeneous products and fixed technological conditions, under an equilibrium situation. Hence it does not incorporate possible longer-term dynamic efficiencies that may flow from the exercise of market power, e.g. in the form of introduction of innovative products into the market. J. Faull and A. Nikpay, *The EC Law of Competition*, Oxford (1999), at 9, 38-40. See also M. Glader, *Innovation Markets and Competition Analysis: EU Competition Law and U.S. Antitrust Law*, Edward Elgar (2006), at 7.

26 Goyder (2003), *op. cit.*, at 9-11.

The same cannot always be said about monopolies. In contrast to perfect competition, monopolies do exist in some markets. Yet a 100% natural monopolist, in a market where new entry is absolutely impossible, is rare. Such a monopoly can usually be witnessed in public utilities or transport markets, and it is typically created and maintained by government policies. Outside these circumstances, pure monopolies are seldom seen. It is, however, not uncommon that markets are dominated by few leading firms, a structure referred to as an *oligopoly*,<sup>27</sup> or by one dominant firm with a fringe of smaller competitors. In fact, most antitrust policy and enforcement is aimed at such markets, in which no single firm controls the entire market, but rather a certain significant fraction of it. These monopolies may pose the same type of competition law concerns as those arising in a pure monopolistic market, since the dominant firm is a monopolist with respect to the portion of industry demand that remains after the supply of competitors is subtracted. Consequently, the foregoing result of monopoly pricing generalises to the case of a dominant firm.

In fact, in real-world markets, many firms face a downward-sloping demand curve to some extent, and further possess the ability to profitably raise price above the competitive level. Hence, the vast majority of firms in differentiated products industries are said to exercise a certain degree of market power.<sup>28</sup> For example, consider that toothpaste market. Some brands, such as “Colgate” or “Aquafresh” enjoy a strong market position, but they are not the sole players in the market and do not have a sufficiently strong ability to increase price unilaterally above a certain level. Consumers of these products may agree to pay 10 cents more for their favourite toothpaste, but the number of people willing to pay an additional Euro or two would be much less.

The possession of some market power can be therefore classified as the rule rather than the exception. Almost every firm has at least a little market power over the sales of its special product, resulting from unique brand recognition,

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27 This market structure, lying on the spectrum between perfect competition and monopoly, is characterised by a strategic interaction between market participants, as each firm recognises that it is affected by the pricing and output decisions of its competitors. The basic model of oligopoly pricing was developed by A. Cournot, *Researches into the Mathematical Principles of the Theory of Wealth*, Macmillan (1838). For a straightforward presentation of the model see Pindyck and Rubinfeld (2005), *op. cit.*, at 441-447. Other important models employed in competition analysis are the Bertrand model of oligopoly and the model of monopolistic competition. See e.g. L.M.B. Cabral, *Introduction to Industrial Organization*, MIT Press (2000), at Chapter 7. Note, however, that whilst some of these models imply that the price exceeds marginal cost, they do not necessarily indicate the absence of effective competition. For an overview see Bishop and Walker (2002), *op. cit.*, at 27-35.

28 On product differentiation see generally G.J. Werden, *Simulating the Effects of Differentiated Products Mergers: A Practical Alternative to Structural Merger Policy*, 5 *George Mason Law Review* 363, 367-371 (1997); S. Baker and A. Coscelli, *The Role of Market Shares in Differentiated Products Markets*, 20 *European Competition Law Review* 412 (1999); D.L. Rubinfeld, *Market Definition with Differentiated Products: The Post/Nabisco Cereal Merger*, 68 *Antitrust Law Journal* 163 (2000).

consumers' preferences, attributes, quality, an innovative or superior product, and so forth. It should be recognised that in most industries firms with varying degrees of market power can be found. The demand each firm is facing will not be as steep as the monopoly demand curve (since the monopoly serves the entire market demand and faces no form of competition), but it will rather be some part of it, depending on the strength and economic position of the firm under investigation.

### 2.3 The Assessment of Market Power

Given the central role of market power in competition policy, an important question remains: how can one identify whether a firm or a group of firms are able to exercise market power? Moreover, since market power is a matter of degree, the problem of measuring and quantifying market power immediately presents itself.

Traditional definitions of market power found in industrial organization literature clearly draw from the model of perfect competition, by focusing on the individual firm's power to price above the competitive level. In particular, many industrial economics books refer to discretion over price (the extent to which a firm or group of firms could price its product above marginal costs) as the relevant proxy for market power.<sup>29</sup>

This approach is manifested in several competition law provisions, for example, the Commission's Guidelines on vertical restraints define market power as "the power to raise price above the competitive level and, at least in the short term, to obtain supra normal profits".<sup>30</sup> Likewise, the 2002 Guidelines on the assessment of significant market power in electronic communications, relate market power to the ability to raise prices by restricting output without incurring a significant loss of sales or revenues.<sup>31</sup> The latter definition differs, however, from the

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29 S. Martin, *Industrial Organization, A European Perspective*, Oxford (2002), at 19; D.W. Carlton and J.M. Perloff, *Modern Industrial Organization*, Addison-Wesley (4<sup>th</sup> ed., 2005), at 642. See also W.M. Landes and R.A. Posner, *Market Power in Antitrust Cases*, 94 *Harvard Law Review* 937, 937 (1981); Van den Bergh and Camesasca (2006), *op. cit.*, at 105-106. Economic theory also makes clear that market power should constitute a competition law concern only if barriers to entry impede the successful penetration of potential rivals, thereby allowing the incumbent to reap supra-competitive profits.

30 Commission Notice, *Guidelines on Vertical Restraints*, OJ C 291/1 (2000), at para. 119.

31 Commission Guidelines on Market Analysis and the Assessment of Significant Market Power under the Community Regulatory Framework for Electronic Communications Networks and Services, OJ C 165/3 (2002), at para. 73.



one offered by the relevant case law, labelling market power in terms of independent behaviour in the marketplace.<sup>32</sup> In the seminal *United Brands* and *Hoffmann-La Roche* cases, the European Court of Justice defined the latter firms' dominance as:<sup>33</sup>

“... a position of economic strength enjoyed by an undertaking which enables it to prevent effective competition being maintained on the relevant market by affording it the power to behave to an appreciable extent independently of its competitors, customers and ultimately of its consumers”.

Whereas the economic notion focuses upon the ability of an undertaking to price its product above the competitive level for a sustainable period of time, the legal definition emphasises the ability of a firm to behave independently, thus embracing concerns over limitations imposed on the economic freedom of market participants.<sup>34</sup> Nonetheless, whilst not explicitly adopted by the European Court of Justice, the economic definition is utilised as a yardstick for competition analysis by numerous competition authorities.<sup>35</sup>

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32 R. Whish, *Competition Law*, LexisNexis UK (5<sup>th</sup> ed., 2005), at 179; V. Korah, *An Introductory Guide to EC Competition Law and Practice*, Hart (8<sup>th</sup> ed., 2004), at 94; Jones and Sufrin (2004), *op. cit.*, at 263; Motta (2004), *op. cit.*, at 88.

33 Case 27/76 *United Brands v. Commission*, (1978) ECR 207, at para. 65; Case 85/76 *Hoffmann La Roche v. Commission*, (1979) ECR 461, at para. 38.

34 The latter proposition is associated with the goals of EC competition law, mainly pursuing allocative efficiency and the protection of individual economic freedom, rooted in Ordoliberal ideology. See Van den Bergh and Camesasca (2006), *op. cit.*, at 106. For problems associated with the formulation of the test by the ECJ see D. Geradin, P. Hofer, Fr. Louis, N. Petit and M. Walker, *The Concept of Dominance*, In: GCLC Research Papers on Article 82, EC Global Competition Law Centre (July 2005), at 7.

35 Office of Fair Trading, *Guidelines on the Assessment of Market Power* (2004), at para. 1.4 (referring to market power as “the ability profitably to sustain prices above competitive levels or restrict output or quality below competitive levels”); U.S. Department of Justice and the Federal Trade Commission *Horizontal Merger Guidelines*, 57 Fed. Reg. 41552, reprinted in 4 Trade Reg. Rep. (CCH), 104 (1992, revised April 1997) (hereinafter, “U.S. Merger Guidelines”), at §0.1 define market power as “the ability to profitably maintain prices above competitive levels for a significant period of time”. Notably, the U.S. Supreme Court seems to have adopted an economic definition of market power similar to the ones discussed above. In *Jefferson Parish Hospital Dist. V. Hyde*, 466 U.S. 2, at 27, the court stated that “as an economic matter, market power exists whenever price can be raised above the levels that would be charged in a competitive market”. Similar definitions could be drawn from other court’s decisions. E.g. *NCAA v. Bd. Of Regents of the Univ. of Okla.*, 466 U.S. 85, 109 (1984) (“the ability to raise prices above those that would be charged in a competitive market”); *Consul, Ltd. V. Transco Energy Co.*, 805 F.2d 490, 495 (4<sup>th</sup> Cir. 1986) (“the ability to raise prices above levels that would have existed in a perfectly competitive market”); *Coastal Fuels, Inc. v. Caribbean Petroleum Corp.*, 79 F.3d 182, 196 (1996). See also R. Posner, *Antitrust Law*, University of Chicago Press (2<sup>nd</sup> ed., 2001), at 9 (maintaining that “a monopolist is a seller ... who can change the price at which his product will sell in the market by changing the quantity that he sells ... This ‘power over price’, the essence of economic concept of monopoly, derives from the fact that market price is inverse to quantity”).

In that vein, market power may be identified based on the existence of three important elements:<sup>36</sup>

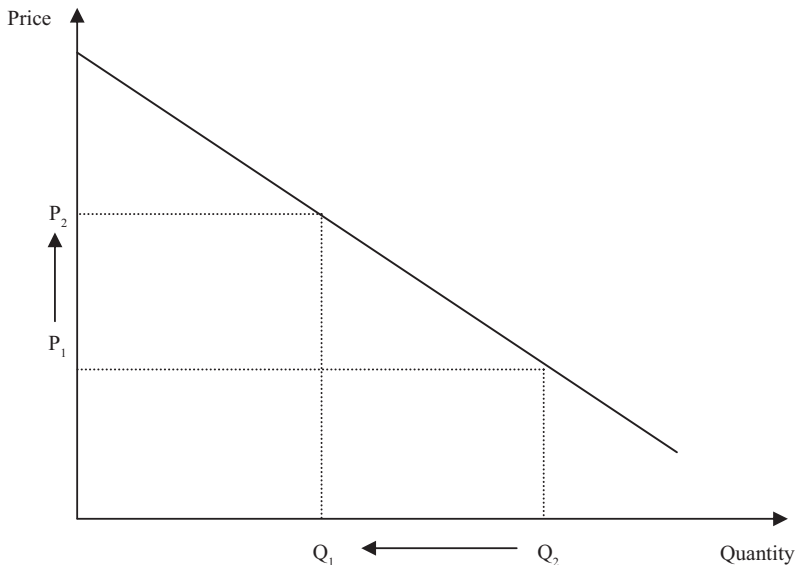
- (1) The exercise of market power leads to lower output.
- (2) The increase in price must lead to an increase in profitability.
- (3) Market power is exercised relative to the benchmark of the outcome under conditions of perfect competition.

In the following sections, each one of these components is discussed in detail.

### 2.3.1 The Exercise of Market Power Leads to Lower Output

The first element is derived from the shape of consumers' demand curve. It may be intuitively understood that the lower the price, the higher the quantity demanded by consumers. Inversely, at very high prices, the quantity demanded can approach zero. As discussed earlier, any firm holding market power faces a demand curve that slopes downward to a certain extent (as opposed to firms in perfect competition, which face a perfectly horizontal demand curve). This shape of demand dictates that any increase in price will necessarily be accompanied by a decrease in output, as illustrated by figure 4:

**Figure 4.** The Adverse Relationship between Price and Quantity Demanded



36 Bishop and Walker (2002), *op. cit.*, at 44 and the ensuing discussion at 44-50.

Resulting from the relationship depicted in figure 4, under a set of given market conditions (e.g. firm's capacity, technology used in the production process, prices of competing products), every firm that prices its product higher than the competitive level will evidently also restrict output.

### 2.3.2 The Increase in Price Leads to an Increase in Profitability

The second element, profit-maximisation, presupposes that the exercise of market power leads to an increase in the firm's profitability. Whilst any firm may unilaterally undertake to raise the price it charges for a product, such action may not necessarily be profitable, and may not imply the exercise of market power. Hence, a firm may be said to possess market power only when the price rise allows it to enjoy excess profits.

As shown in figure 4, any price increase above the competitive level results in a decrease in the quantity demanded. The fundamental question, however, is by how much the demand falls when the price rises. If the fall in demand is trivial and is outweighed by the higher per-unit margin, then increasing price above the competitive level and restricting output respectively is likely to induce profits to rise.<sup>37</sup>

In order to predict whether the increase in price will offset the declining demand one must gauge the demand conditions faced by a firm. Those exist, in essence, at the whim of consumers' preferences, depending on the value and desirability attached to the product, and on the number of alternative products available to consumers in the market. On the occasion of a price increase, consumers' substitution depends on whether they can and want to switch to other products, and on the extent to which alternative suppliers of the same product are available on the market. In fact, all those substitution possibilities are summarised in the demand curve faced by the firm. Consequently, a firm's ability to exercise market power depends on the sensitivity of demand to price changes, which is measured by the firm's *own-price elasticity of demand*. The own-price elasticity of demand for a product indicates the responsiveness of its quantity demanded to a change in its price. Specifically, the own-price elasticity of demand is defined as a percentage change in quantity demanded of a product resulting from a one percent increase in its price:<sup>38</sup>

$$(2) \quad \varepsilon = \% \Delta Q / \% \Delta P$$

37 Note that since profits are equal to revenue minus costs, an additional account has to be paid to any cost savings generated by the price increase. In some cases, the restriction of output will induce a reduction in costs, as fewer units will have to be produced, thereby altering the calculation of profits. For further discussion see Chapter 4.

38 Pindyck and Rubinfeld (2005), op. cit., at 32. Accordingly, the own-price elasticity will always be negative, although it is often discussed in terms of the absolute value.

An estimated elasticity can precisely reveal consumer reaction to a price increase. For example, an elasticity of  $-2$  reveals that a 1% price increase will result in a 2% decrease in the quantity demanded. Similarly, an elasticity of  $-0.3$  implies that demand will decrease by 0.3% in response to a 1% price increase. Demand is said to be elastic if a 1% price increase leads to a more than 1% decrease in quantity. High own-price elasticity (typically larger than 1 in absolute terms) implies that the extent to which a firm can increase price above the level that would prevail under effective competition is limited, since for every 1% increase in price, sales would fall by more than 1%. In contrast, if the own-price elasticity of demand is lower than 1, demand is said to be inelastic (rigid), as any price increase will be associated with an insignificant drop in sales, entailing that the exercise of market power is more likely.

It is, therefore, clear that the magnitude of market power is negatively correlated to the price elasticity of demand. More specifically, the degree of market power can be shown to be proportional to the reciprocal of the elasticity of demand. Upholding the profit-maximising condition of the monopolist or the dominant firm, the following relationship can be derived:<sup>39</sup>

$$(3) \quad (P - MC) / P = -1 / \epsilon$$

The expression on the left-hand side of equation 3, which has come to be known in economics as the *Lerner Index*, relates market power to the difference between current price and marginal cost as a percentage of the prevailing price (this is commonly termed the *price-cost margin*).<sup>40</sup> The right-hand side reflects the inverse relationship between market power and the elasticity of demand, since the higher the elasticity (in an absolute value), the lower the ability of a firm to deviate from marginal cost pricing.

Although the standard economic concern translates an increase in market power to an increase in the Lerner Index, due to the traditional limited applicability of the marginal cost concept economists often focus on the elasticity of demand to infer market power.<sup>41</sup>

This crucial interrelation between market power and price elasticity of demand highlights the significance of demand elasticities in competition analysis. When

39 Pindyck and Rubinfeld (2005), op. cit., at 353.

40 A.P. Lerner, The Concept of Monopoly and the Measurement of Monopoly Power, 1 Review of Economic Studies 157, 169 (1934).

41 In fact, in some cases the marginal cost cannot be measured at all, and is often a hypothetical construct. Landes and Posner (1981), op. cit., at 941; Werden G.J., Demand Elasticities in Antitrust Analysis, 66 Antitrust Law Journal 363, 394 (1998).

known, demand elasticities can be utilised to directly measure the degree of market power exercised by a firm, since an estimated elasticity will effectively reveal the exact scope of a firm's ability to price its product above the competitive level<sup>42</sup>.

In light of its prominence, two important issues in the context of demand elasticities necessitate additional attention. The first concerns the connection and difference between the own-price elasticity of demand and the *cross price elasticity of demand*, which is more often invoked in competition law analysis. The cross price elasticity of demand measures the degree of substitutability between two products, and is defined as the percentage change in the quantity demanded of one product (X) resulting from a 1% increase in the price of another product (Y)<sup>43</sup>:

$$(4) \quad \varepsilon_{xy} = \% \Delta Q_x / \% \Delta P_y.$$

The cross-price elasticity of product X with respect to product Y measures the extent to which the volume of sales of X responds to changes in the price of Y. A positive value for the cross-price elasticity indicates that substitution between the products exists, since an increase in the price of one increases the demand for the other. Alternatively, a negative value for the cross-price elasticity signifies that the products are complements, since an increase in the price of one reduces sales of the other.

Cross-price elasticities are often estimated for the purpose of analysing the competitive constraints faced by the firm. Using cross-price elasticities, it is possible to deduce whether a producer of a given product is disciplined by the presence of a large number of substitutes. Such inference allows a better understanding of the competitive interaction within an industry, provides a measure of interchangeability and a ranking of substitutes. It cannot, however, provide direct evidence on the degree of market power, as proffered by the own-price elasticity of demand.<sup>44</sup>

The following example demonstrates the relationship between own-price and cross-price elasticities in the market definition exercise. Suppose a product A is currently priced at €20. At this price level, the firm producing A sells 1,000 units, so that its revenue is equal to €20,000. The firm's marginal cost is constant and equal to €10, and there are no fixed costs, so that the total cost of producing

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42 Using this tool is not, however, free from complications. The task of estimating elasticities is highly demanding, and involves intricate statistic and econometric issues, that will be addressed in the following chapters.

43 Pindyck and Rubinfeld (2005), op. cit., at 34.

44 For an elaborated discussion see Chapter 4.

1,000 units is €10,000. Table 1 illustrates the impact of increasing product A's price to € 21 – a 5% price increase.

**Table 1.** Effect of a Hypothetical Price Increase

	Price of A is equal to €20	Price of A increases to €21	
		$\epsilon_A =$	
		-0.4	-2
Units sold	1,000	980	900
Revenue	20,000	20,580	18,900
Costs	10,000	9,800	9,000
Profits	10,000	10,780	9,900

As can be seen, all changes in revenues, costs and profits of the firm producing A are directly linked to the magnitude of its demand elasticity. When the elasticity is as low as -0.4, a 5% price rise would lead to merely 2% drop in sales, and would hence be profitable. In contrast, if the firm's demand elasticity is as high as -2 (since, for example, producers of other attractive substitutes are engaged in the market), a similar price increase could generate losses. The own-price elasticity of demand may, therefore, have a decisive role in the analysis of market power, as it provides a direct indication for the ability of a firm to raise the price profitably.

This elasticity should be distinguished from the cross-price elasticity of demand, which contributes a different type of information to the analysis. Consider further product C, which is regarded to some extent as a substitute for product A. The degree to which consumers are willing to replace C with A upon a price increase of A can be conveyed by cross-price elasticity data. A cross-price elasticity of 1 for instance would reveal that a 5% increase in the price of A will increase C's sales by 5%. This data can serve to evaluate the closeness between products A and C, but insofar as A's market power is concerned such evidence is mostly circumstantial. That is, it can testify about the existence of a potential substitute to A, but it cannot infer whether A's price could actually be raised profitably.

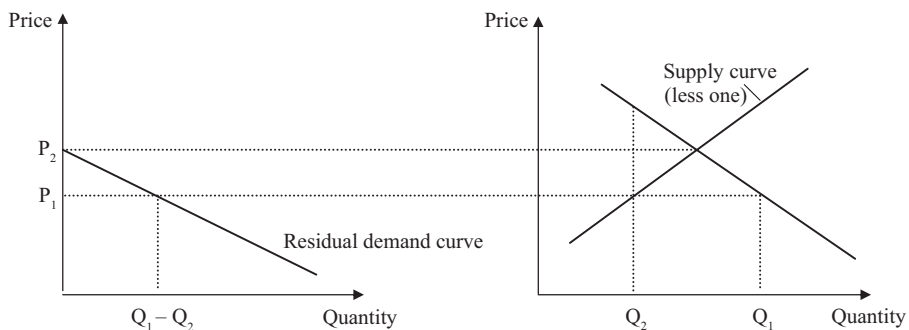
This simplified example elucidates why the problem of measuring market power aggravates in differentiated products industries. In reality, most industries encompass a wide range of overlapping products with differing product

specifications, to fit the individual needs of particular users. In such an environment, market power inferences require a great number of own-price and cross-price elasticity estimates, a task that is often complex and dependent upon the availability of data. As discussed in subsequent chapters of this book, several quantitative techniques may offer valuable insights to tackle this problem.

A second important remark concerns the nature of the firm's demand curve, which is used for the analysis of market power. Once more, a distinction needs to be drawn between the demand curve facing the industry as a whole, and the demand curve faced by an individual firm, commonly referred to as the *residual demand curve*. Residual demand of an individual firm is defined as the demand that is not met by other firms in the industry.<sup>45</sup> Hence, the residual demand curve is the industry demand curve minus the supply of rivals, actually and potentially selling demand substitutes. Such a demand curve should be distinguished from the structural demand curve presented earlier in this chapter. The latter depicts the amount of sales consumers are willing to purchase of a product at various prices, whilst holding the supply responses of all other products constant. A residual demand curve equally indicates the amount consumers are willing to purchase at various prices, but under the assumption that the supply of all other products adjust accordingly.<sup>46</sup>

Figure 5 below shows how the residual demand curve of a particular firm is derived from the industry demand curve and the supply curve of other firms in the industry.<sup>47</sup>

**Figure 5.** Derivation of the Residual Demand Curve



45 Bishop and Walker (2002), op. cit., at 47-48.

46 J.B. Baker and T.F. Bresnahan, Estimating the Residual Demand Curve Facing a Single Firm, 6 International Journal of Industrial Organization 283 (1988).

47 Bishop and Walker (2002), op. cit., at 48.

On the right-hand side, figure 5 shows the industry demand curve and the supply of all firms in the industry except for the firm in question. Since the residual demand only relates to the fraction of the demand for a product that is not met by the other firms in the industry, the curve can be constructed by deducting the supply of other firms from the industry demand curve. The individual firm's residual demand curve, on the left-hand side, is hence structured according to the horizontal difference between the market demand curve and the supply of all other firms. Differently stated, the quantity demanded of the individual firm's product at any price level is equal to the total industry demand, minus the quantity already supplied by other competitors in the industry.

For example, at market price  $P_2$  (and at any price above), other firms in the industry already fully supply the quantity demanded by consumers, and the residual demand is therefore equal to zero. At price  $P_1$ , consumers demand the quantity  $Q_1$ , out of which  $Q_2$  is provided by the other firms, and the remaining quantity  $Q_1 - Q_2$  is supplied by the individual firm.

A firm operating in a perfectly competitive market, for instance, faces an infinitely elastic residual demand curve, since if it raises the price of its product even slightly, it will lose all its customers to competitors. Hence, the fewer the competitive constraints from competing producers, the less elastic the residual demand faced by the firm. Moreover, the elasticity of the industry demand curve and the individual firm's residual demand curve will generally differ, i.e. for a firm with any degree of dominance, the residual demand curve will be flatter (more elastic) than the industry demand curve. The reasoning behind this is straightforward. An individual firm provides only a portion of the total demand for a certain product, and is thus constrained by other producers of the product within the same industry, whereas for the industry as a whole, lesser substitutes are available. Only in the extreme case of a monopoly is the residual demand curve of the market's single producer identical to the industry demand curve.

Among economists there is a consensus that residual demand analysis is the critical concept underlying the exercise of market power in general and the definition of the relevant antitrust market in particular.<sup>48</sup> As the residual demand curve accounts for competitors' reactions to any price change contemplated by the firm, it can reveal whether a firm or a group of firms could profitably maintain a significant and long-lasting price increase, thereby affording all the necessary information to establish the degree of its market power.

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48 Landes and Posner (1981), op. cit.; D.T. Scheffman and P.T. Spiller., Geographic Market Definition under the U.S. Department of Justice Merger Guidelines, 30 *Journal of Law & Economics* 123 (1987); L.M. Froeb and G.J. Werden, Market Delineation under the Merger Guidelines: The Role of Residual Demand Elasticities, Economic Analysis Group Discussion Paper 90-3 (1990).



To illustrate, consider a provisional market consisting of all manufacturers of carbonated soft drinks (among all possible soft drinks). To confirm or reject the possession of market power by soft drinks producers, residual demand analysis would seek to identify those situations in which costs were raised simultaneously for all firms selling in the market, without raising the costs for rivals selling possible demand substitutes outside that market (e.g. juice, coffee, milk). If manufacturers of carbonated soft drinks could respond to such industry cost augment by raising their prices respectively without suffering a shift of consumers to juice or other alternative drinks, and without fearing supply reactions by juice producers (changing their production lines to manufacture carbonated drinks), then they are likely to form a relevant antitrust market. The residual demand elasticity – indicating the extent to which the group of products comprising the candidate market is able to increase the price unilaterally and irrespectively of demand responses by buyers and supply responses by rivals – can be therefore highly informative in answering the ultimate question of competition law inquiries, which is the measurement of market power.<sup>49</sup> Nonetheless, as further discussed in Chapter 3, often the structural demand curve rather than the residual demand curve is considered in legal practice.

### **2.3.3 Market Power is Exercised Relative to the Outcome under Perfect Competition**

In the assessment of market power, price and output under conditions of perfect competition are taken as the yardstick against which a firm's conduct is assessed. The question may arise, why the current price level is not taken as the benchmark for identifying market power. The answer lies within the assumption of profit-maximisation by rational firms. If it had been profitable for a firm to charge a higher price, it would have already done so. The prevailing price chosen by the firm indicates that this is the actual level where the firm's profits are already maximised. Therefore, there is no point in questioning whether a firm can profitably increase price above the current level, since the answer would inevitably be no. For the purpose of examining whether a firm is exercising market power, the appropriate concern should therefore be whether the firm is able to persistently maintain price above the level that would prevail under perfectly competitive conditions.

There is sometimes a tendency in academic literature to equate the competitive price level with short-run marginal costs, resulting from the application of the idealised economic model of perfect competition. One may recognise,

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<sup>49</sup> Scheffman and Spiller (1987), *op. cit.*; J.B. Baker and T.F. Bresnahan, *Empirical Methods of Identifying and Measuring Market Power*, 61 *Antitrust Law Journal* 3 (1992), at 8-9.

however, that MC is not readily detected, and consequently, the identification of the competitive price level plays a minimal role in the application of competition law. In fact, if the competitive level could have been identified easily, conducting competition law investigations would be trivial, since the observed price levels would be compared with competitive price levels, thereby providing a direct indication of whether the competitive concerns are justified. In reality, this is not a straightforward task, and the competitive price level can seldom be tracked.<sup>50</sup> Moreover, even if marginal costs can be detected, prices in most industries exceed, in effect, short-run marginal costs, a situation that is not necessarily inconsistent with effective competition. Since not all markets obviously require competition law intervention, it is necessary to be able to distinguish between industries with significant, or troubling market power, and industries that are sufficiently competitive, even if the price of the product in question indeed surpasses the perfectly competitive benchmark.<sup>51</sup>

## 2.4 Indicators of Market Power

As the forgoing discussion illustrates, depicting market power as the persistent setting of price in excess of the level that would prevail under perfect competition may pose several difficulties to competition law practice. First, a straight comparison between the current price and the competitive price is not possible, since only the former price level can be observed. Moreover, as almost any real-world firm potentially subscribes to this definition, there is a genuine need in the legal discourse to effectively discern varying degrees of market power.<sup>52</sup> Naturally, not all degrees warrant similar regulatory concerns, and competition law enforcement will usually come into play only when market power is present to a sufficiently significant and durable extent. Nonetheless, what threshold separates significant market power, which necessitates a closer scrutiny, from insignificant one, remains a matter of debate.

European competition law, as outlined by the European Court of Justice, attributes significant market power to dominant firms that enjoy “a degree of general independence in its behaviour on the relevant market which enables it to hinder

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50 Werden (1998), *op. cit.*, at 394.

51 Bishop and Walker (2002), *op. cit.*, at 42-43. See also K.U. Kühn, P. Seabright and A. Smith, *Competition Policy Research: Where Do We Stand?*, Occasional Paper No. 8, Centre for Economic Policy Research (1992).

52 Bishop and Walker (2002), *op. cit.*, at 42.

to a large extent any effective competition”.<sup>53</sup> Consequently, the relevant case law refers to market power in terms of independent behaviour in the market, and points to a position of economic strength enjoyed by a firm, which enables it to prevent the maintenance of effective competition on the relevant market, by giving it the power to behave to an appreciable extent independently of its competitors and consumers.<sup>54</sup>

To tackle the need to establish the existence of market power for the purpose of competition analysis, an indirect analytical approach has emerged in competition law practice. The latter scrutinises the distinct characteristics of the competitive process in a particular industry, and draws inferences on the nature of the interaction and conduct of firms under investigation. Applying this methodology, developed gradually through case law and regulations, market power is not directly estimated but is rather deduced from the accumulation of a number of indicators characterising the industry. Those include an estimation of the firm’s market share based on a protracted definition of the relevant market within which the firm acts, the level of industry concentration (i.e. the number of alternative suppliers in the market and their respective market shares), the feasibility of substitution upon a price increase, and most crucially, the existence of barriers to entry, affecting the ability of potential competitors to access the market and erode monopoly profits. On a stand-alone basis these indicators may not necessarily be determinative, but when weighted together they are used to point out to the existence of market power.<sup>55</sup>

This approach is often referred to as a ‘structural analysis’, commonly accredited to the Structure-Conduct-Performance paradigm (SCP), a most prominent branch of industrial organization that originated in the U.S. during the first half of the previous century. As the theory remains highly influential in antitrust analysis, its basic tenets are discussed below.

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53 Case 27/76 *United Brands v. Commission* (1978) ECR 207, at para. 59.

54 The aforementioned definition has been used repeatedly by the Commission and the Community courts. See e.g. *Re Continental Can Co. Inc.*, (1972) JO L 7/25, at para. 3; *Case 85/76 Hoffmann La Roche v. Commission*, (1979) ECR 461, at para. 38; *Case T-128/98 Aéroports de Paris v. Commission*, (2000) ECR II-3929, at para. 147; *Case T-139/98 AAMS v. Commission*, (2001) ECR II-3413, at para. 51; *Case T-219/99 British Airways v. Commission*, (2003) ECR II-05917, at para. 189; *Case T-65/98 Van den Bergh Foods v. Commission*, ECR II-4653 (2003), at para. 154. For further discussion of the legal definition and its relation to the economic concept, see Jones and Sufrin (2004), op. cit., at 262-266; J. Pearce and M. Walker, *Dominance: Meaning and Measurement*, 27 *European Competition Law Review* 363, 364 (2002).

55 Jones and Sufrin (2004), op. cit., at 297; Van den Bergh and Camesasca (2006), op. cit., at 107; G. Church and R. Ware, *Industrial Organization: A Strategic Approach*, Irwin/McGraw Hill (2000), at 612. For an elaborated discussion see Bellamy and Child (2001), op. cit., at 386-400 and 686-713, Bishop and Walker (2002), op. cit., at 51-73.

### 2.4.1 The Persistent Structure-Conduct-Performance Paradigm

In the 1930s, economists have begun to link anticompetitive threats to particular industry structures. However, it was not until the 1950s that the Structure-Conduct Performance (S-C-P) paradigm had developed into a complete model.<sup>56</sup> The paradigm presupposed a causal relationship between the structure of a certain industry, a firms' conduct and market performance. This implied that market performance (the success of an industry in producing benefits for society) was dependent upon the conduct of sellers and buyers (for example, regarding prices, advertising, research and development). Conduct in turn was determined by the structure of the market, namely by the number of buyers and sellers, barriers to entry and the degree of product differentiation. The structure of an industry depended on basic demand and supply-side conditions, such as raw materials, technology, or rate of growth. In other words, the S-C-P postulated that certain industry structures, particularly highly concentrated industries accompanied by high barriers to entry, dictated the conduct of firms in those industries (engaging, for example, in oligopolistic behaviour<sup>57</sup>), which in turn lead to poor market performance in the form of restricted output and increased prices.

Since this relationship was assumed to be stable, and as conduct was considered difficult if not impossible to observe directly, an important inference of the S-C-P paradigm was to rely on the direct link between the two sets of the more easily observed variables, structure and performance, asserting that one could improve market performance by regulating market structure.

The paradigm relied on empirical studies to establish a strong positive correlation between industry structure and firms' level of profits.<sup>58</sup> Namely, firms' profits appeared to be higher in concentrated industries characterised by high entry barriers. This result was used to imply that antitrust policy should aim at altering industry structures, in order to achieve better market performance.

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56 E.S. Mason, Price and Production Policies of Large-Scale Enterprise, 29 *American Economic Review* 61 (1939); E.S. Mason, The Current State of the Monopoly Problem in the United States, 62 *Harvard Law Review* 1265 (1949); J. Bain, Relation of Profit Rate to Industry Concentration: American Manufacturing, 1936-1940, 65 *Quarterly Journal of Economics* 293 (1951); J. Bain, Barriers to New Competition, Harvard University Press (1956); J. Bain, *Industrial Organization* (2<sup>nd</sup> ed., 1968); E.S. Mason, *Economic Concentration and the Monopoly Problem*, Harvard University Press (1964); E.H. Chamberlin, *The Theory of Monopolistic Competition*, Harvard University Press (8<sup>th</sup> ed., 1962). For an overview of the underlying principles of the S-C-P methodology see H. Hovenkamp, *Federal Antitrust Policy, The Law of Competition and Its Practice*, West (3<sup>rd</sup> ed., 2005); Church and Ware (2000), op. cit., at 425-431; Cabral (2000), op. cit., at 156-157; Carlton and Perloff (2005), op. cit., at 2-4.

57 In oligopolistic markets a small number of market rivals co-ordinate their behaviour to restrict output and increase prices. The fewer the firms, the easier it is for them to co-ordinate their activities, and the closer the price comes to monopoly pricing.

58 Market performance was typically measured by using profitability variables. Specifically, three major measures were used: The rate of return, which is based upon profits earned per dollar of investment; the price-cost margin, or the Lerner index, using AVC to proxy MC; and Tobin's q, which is the ratio of the market value of a firm to its value based upon the replacement cost of its assets.

It must be noted that the paradigm refrained from treating firms' conduct (which may, in itself, greatly affect market performance), since conduct was considered difficult to control, whilst changing structure was relatively simple. Moreover conduct was assumed to be an inherent feature. Namely, anti-competitive conduct, such as price and output co-ordination, was assumed to result from the very nature of highly concentrated industries, and hence, there appeared to be no point in trying to regulate it. More effective would therefore be to regulate the industry structure directly.

The above suggestions carried broad implications for antitrust policy, both for merger analysis and monopolisation cases. With respect to mergers, the S-C-P model implied that a post-merger increase in concentration was sufficient to prohibit mergers. Thus, it was not necessary to show that the merger was likely to induce anti-competitive behaviour, such as collusion, but rather the merger was judged strictly on the basis of its structure.<sup>59</sup> Similar focus on structure rather than conduct was apparent in establishing liability in monopolisation cases. As the S-C-P model contended that remedies to competition problems should be structural rather than behavioural, and since high degrees of industry concentration were thought to presuppose market power, monopolies were nearly condemned without any specific finding of their anti-competitive doing.<sup>60</sup>

Notwithstanding its paramount influence, the S-C-P paradigm has raised considerable critique questioning its primary assumptions.<sup>61</sup> The one-way chain of

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59 Compelled by case law precedents, the 1968 U.S. Merger Guidelines, stated at §2: "Market structure is the focus of the Department's merger policy chiefly because the conduct of the individual firms in a market tends to be controlled by the structure of the market". Along these lines, the Guidelines introduced the use of concentration measures into the assessment of measures, which are routinely used up to this day.

60 Hovenkamp (2005), *op. cit.*, at 44. Notably, EC competition policy adopts, to this day, an implicit presumption linking dominance and its abuse. Particularly, it is not necessary to show that the alleged abuse resulted from the existence and exercise of the firm's dominant position. Hence, a particular conduct is often considered not on the basis of its economic consequences but rather on its form. See G. Niels & A. Ten Kate, Introduction: Antitrust in the U.S. and the EU – Converging or Diverging Paths?, 49 *Antitrust Bulletin* 1, 12-13 (2004); Bellamy and Child (2000), *op. cit.*, at 719; Veljanovski (2004), *op. cit.*, at 179; Jones and Sufrin (2004), *op. cit.*, at 278.

61 *Inter alia*, by the Chicago School. See Generally R. Posner, *The Chicago School of Antitrust Analysis*, 127 *University of Pennsylvania Law Review* 925 (1979). See also H. Demsetz, *Industry Structure, Market Rivalry, and Public Policy*, 16 *Journal of Law and Economics* 1 (1973); H. Demsetz, *Two Systems of Belief about Monopoly*, In: *Industrial Concentration: The New Learning*, Little, Brown (H. Goldschmid, H.M. Mann and J.F. Weston eds., 1974); R. Schmalensee, *Horizontal Merger Policy: Problems and Changes*, 1 *Economic Perspectives* 41 (1987); J. Sutton, *Sunk Cost and Market Structure: Price Competition, Advertising, and the Evolution of Concentration*, MIT Press (1991). An overview can be found at Church and Ware (2000), *op. cit.*, at 432-439; Bishop and Walker (2002), *op. cit.*, at 55; Hovenkamp (2005), *op. cit.*, at 44-45.

causation running from structure to conduct to performance has been revoked, and further attention has been drawn to the need to consider a possible reverse link from conduct or performance to structure, and a feedback effect that connects each one of these factors. Just as structure was believed to dictate conduct, conduct is now known to affect structure, e.g. if a firm invests in advertising campaigns that establish its reputation and build consumers' fidelity, eventually creating a barrier to entry into the market. Likewise, performance and conduct are interlinked, since profitability affects investments and R&D expenditures. Performance is also expected to affect structure, since successful undertakings are likely to grow on the expense of unsuccessful ones, thus generating more and more market concentration. Moreover, it is nowadays fairly accepted that high profits earned by large enterprises may be attributed not only to greater market power, but also to greater efficiency of those firms.

Today it is obvious to most competition law practitioners that market operation is much more complex than it was previously believed to be.<sup>62</sup> Attempting to restrain market power by regulating industry structure oversimplifies market forces, and may even be counterproductive.<sup>63</sup> Nonetheless, despite its weaknesses, the S-C-P paradigm remains prevalent to date, and continues to play a significant role in antitrust analysis.<sup>64</sup> Although it is widely acknowledged that structure does not necessarily dictate either conduct or performance,<sup>65</sup> the structuralist emphasis endures, with structure being a prerequisite to almost any anticompetitive performance.<sup>66</sup> Consequently the notions of market structure, entry barriers and the

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62 D.L. Rubinfeld, *Antitrust Policy*, In: *The International Encyclopedia of the Social and Behavioral Sciences*, Elsevier Science 553 (N.J. Smelser and P.B. Baltes eds., 2001), at 556.

63 For example, some concentrated industries are the result of scale economics, and hence imply efficiency savings which might outweigh any advantages of competitive performance. Likewise, concentrated markets may reflect greater efficiency of the incumbents, as is sometimes the case with high-technology and innovation-driven industries.

64 For the more extended version of S-C-P prevailing today see Bishop and Walker (2002), *op. cit.*, at 56.

65 Whereas in current competition law practice great relevance is attached to conduct (as opposed to its S-C-P treatment), contemporary antitrust enforcement is much more rigorous with respect to identifying the circumstances under which anti-competitive conduct emerges. Such conduct is no longer assumed to be an inevitable outcome of concentrated industries, and its existence must be supported by further evidence. Performance too captures an increasing significance in the modern antitrust discourse. Particularly, demonstrated effects of the alleged anti-competitive conduct may sometimes be favoured over structural indicators.

66 Faul and Nikpay (1999), *op. cit.*, at 7: "This extended S-C-P framework is still important today in industrial economics and in competition policy, not as the perfect explanatory framework but as a good way to organize one's thoughts. Market structure is still the starting point for competition policy arguments. It is generally accepted that certain market conditions are a prerequisite for anti-competitive conduct and performance. However, these necessary conditions may not be sufficient"; Bishop and Walker (2002), *op. cit.*, at 55: "... the SCP paradigm remains very influential in modern

firm's market position remain indispensable whenever an alleged anti-competitive strategy is under scrutiny.

#### 2.4.2 Ascendancy of the Structural Analysis

Clearly the most important contribution, inspired by the S-C-P paradigm but still alive in modern practice, is the emergence of an indirect methodological framework for the assessment of market power, generally comprising of the following three stages.<sup>67</sup> First, defining a relevant antitrust market constitutes an obligatory first-step. This preliminary stage of the analysis is attached crucial importance, since market power can be discussed only in relation to an antitrust market.<sup>68</sup> Second, assigning market shares to all recognised market participants. Market shares measure the relative size of the firm in question within the market, and are considered an important indication for the existence of market power,<sup>69</sup> Third, analysing entry conditions. As discussed below, the existence of entry barriers is vital to the analysis, as market power can only be maintained if an undertaking is protected from the threat of potential competition.

The employment of an indirect structuralist approach originated through precedents of the U.S. Supreme Court,<sup>70</sup> based upon the notion of the 'relevant market' as a preliminary and intermediate stage.<sup>71</sup> It was first established then that only by defining the relevant market, it could be properly considered whether effective competition had been distorted or threatened. The competitive assessment does not come to an end with the definition of the relevant market, but rather the investigation is concerned with whether the subject conduct could adversely affect the process of competition, both in monopolisation and merger cases. Therefore, once a market has been defined, the analysis proceeds, *inter alia*, with the calculation of market shares and concentration, and the evaluation of conditions for entry.<sup>72</sup> Quite regularly, high market shares derived from the relevant

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microeconomics and is the basis for most competition policy analysis ..."; Hovenkamp (2005), op. cit., at 45: "These attacks notwithstanding, the S-C-P paradigm has proven hard to kill. It continues to play a role, although greatly accentuated, in antitrust analysis ... The structural emphasis of the S-C-P paradigm remains, but today structure no longer appears to dictate performance; rather, we think of structure as a *prerequisite* to anticompetitive performance. Structure has become a necessary but not a sufficient cause".

67 It should be noted that in some cases a fourth step is introduced, in which efficiencies resulting from the transaction or conduct are considered.

68 This issue is the exclusive focus of Chapter 3.

69 European Commission Glossary of Terms used in Competition Related Matters (2003) ("In competition policy analysis, market shares are an import indicator for the existence of market power).

70 For a general overview see G.J. Werden, The History of Antitrust Market Definition, 76 Marquette Law Review 123 (1992).

71 E.g. Walker Process Equipment, Inc. v. Food Machinery & Chemical Corp., 382 U.S. 172 (1965), at 177: "Without a definition of the relevant market there is no way to measure ... ability to lessen or destroy competition".

72 The above three steps are articulated in the U.S. Merger Guidelines.

market, especially when combined with findings of barriers to entry, serve as a proof of market power.<sup>73</sup>

In European legal practice, the indirect approach for assessing market power has rapidly been embraced, and has become the standard exercise, routinely applied by competition authorities. Similarly to the U.S., recognising that the outcome of any investigation into a firms' conduct is tidily linked to the delineation of market boundaries, every investigation commences with the definition of the relevant market. European courts have on many occasions stressed the role of market definition, as being vital to all aspects of competition law before any breach of law can be established.<sup>74</sup>

With a certain market definition in mind, the analysis proceeds to assess the market shares of the firms involved. High market shares (typically above 50%) are often attached a predictive value as for the degree of market power of the firm, and are viewed as an indicator for dominance.<sup>75</sup> Whilst the interpretation of market shares is largely dependant upon the manner in which the market is defined,<sup>76</sup> they still play a significant role as the primary indication for market power.<sup>77</sup> Practically speaking, many agreements between undertakings will not be considered as anti-competitive if market shares are negligible. Likewise, block exemption regulations, which exempt categories of agreements from Article 81

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73 *The Movie 1 & 2 v. United Artists Communications Inc.*, 909 F.2d 1245 (9<sup>th</sup> Cir. 1990), at 1254: "although market share does not alone determine monopoly power, market share is perhaps the most important factor to consider in determining the presence or absence of monopoly power". See also G.J. Werden, *Assigning Market Shares*, 70 *Antitrust Law Journal* 67 (2002).

74 E.g. *Case 6/72 Europemballage Corp. and Continental Can Inc. v. Commission*, (1973) ECR 215; *Case 322/81 Nederlandsche Banden-Industrie Michelin v. Commission*, (1983) ECR 3461.

75 E.g. *Case C-62/86 AKZO v. Commission*, (1991) ECR I-3359, at para. 104; See also *Guidelines on the Assessment of Horizontal Mergers under the Council Regulation on the Control of Concentrations between Undertakings*, OJ C 31/5 (2004), at para. 17 (hereinafter: "EC Horizontal Merger Guidelines").

76 In a market too narrowly defined high market shares will not contain any valuable information as regards the economic strength of market participants, and as regards the likelihood of collusion. In contrast, in a market that is defined too broadly, market shares will tend to be too low, hence failing to convey the full significance of the anti-competitive conduct encountered.

77 It should be emphasised that the use of market shares figures does not make competition analysis more economic-based. In fact, economic theory clarifies that market shares do not in themselves prove dominance, and using them as a sole determinant for market power is not always predictive. Market shares merely testify on the current state of competition. It reveals nothing, however, as for the reasons for this situation, or the chances and immediacy of potential emerging competition. Even a firm currently controlling 100% of the market may not be able to price above the competitive level (and hence to exercise market power) if rivals can freely enter the market and compete. Consequently, relying exclusively on a market share analysis carries the risk of overstating the market power of the firm under investigation.



prohibition, are based on market shares thresholds,<sup>78</sup> and the classification of a firm as ‘dominant’ under Article 82 equally rests on its market share.<sup>79</sup>

Market shares also serve as the basis for calculating concentration ratios, a common indicator for the existence of market power within a certain market. The use of concentration indicia stems from the above structuralist notion, asserting that firms’ conduct in highly concentrated industries tends to be non-competitive.

Two common concentration ratios are the  $CR_4$  and  $CR_8$ , which sum the market shares of the largest firms in the market, namely the aggregate shares of the four or eight market leaders, respectively. For example, the  $CR_4$  ratio will be 60, if the four largest firms’ shares were 15% each.<sup>80</sup>

An alternative measure, frequently employed in European competition law and American antitrust and incorporated into the merger regulation, is the Herfindahl-Hirschman Index (HHI).<sup>81</sup> The HHI measures the sum of the squares of the market shares of every firm within the market, thereby giving greater weight to the market shares of the largest firms. HHI levels may approach 10,000 (in case of a pure monopolist) and zero (in the case of a perfectly competitive market). For a market that includes, for example, 5 firms with market shares of 40%, 30%, 10%, 10% and 10%, the HHI level would be equal to 2800 (1600 + 900 + 100 + 100 + 100). An additional factor taken into consideration is the change in the HHI (known as the ‘delta’), which is used as a proxy for the change in concentration brought about by the merger.

The absolute level of the HHI can therefore provide an initial indication of the competitive pressure in the market post-merger. Nonetheless, the threshold used for invoking competition concerns may diverge. The EC Horizontal Merger Guidelines establish that markets featuring post-merger HHI below 1,000 are unlikely to prompt regulatory intervention.<sup>82</sup> An HHI between 1,000 and 2,000 and a delta below 250, or a post-merger HHI above 2,000 and a delta below 150 may

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78 E.g. Commission Notice on Agreements of Minor Importance Which Do Not Appreciably Restrict Competition under Article 81(1) of the Treaty Establishing the European Community (de minimis), OJ C 368/13 (2001).

79 Jones and Sufrin (2004), *op. cit.*, at 340.

80 The  $CR_4$  ratio will produce, however, a similar result also if the four largest firms have 45%, 10%, 3% and 2% market shares, although the competitive interaction in the latter case (in the presence of a distinguished market leader) is likely to differ. This is a significant shortcoming of concentration ratios, together with the fact that such ratios incorporate neither the total number of firms in the market, nor the shares of smaller rivals, who may nevertheless impose an important competitive constraint. See Bishop and Walker (2002), *op. cit.*, at 56.

81 U.S. Merger Guidelines, at § 1.5; EC Horizontal Merger Guidelines, at para. 16, 19-21.

82 EC Horizontal Merger Guidelines, at para. 19.

also be exempted from antitrust scrutiny, unless special circumstances arise.<sup>83</sup> In comparison, HHI levels presented in the U.S. Horizontal Merger Guidelines somewhat differ. Whilst a market will be regarded as non-concentrated if the post-merger HHI is below 1,000, an HHI between 1,000 and 1,800 is indicative of a moderate level of concentration. Combined with a delta higher than 100, such a market may raise antitrust concerns depending on a number of other factors incorporated in the assessment (i.e. potential competitive effects, entry and generated efficiencies). An HHI surpassing 1,800 and a delta above 50 raise significant competitive concerns, and in cases where the delta exceeds 100, the merger is presumed to create or enhance market power or facilitate its exercise.<sup>84</sup>

Finally, transactions that have failed the concentration test are subject to an evaluation of entry conditions into the market.<sup>85</sup> The ability of a single producer or a dominant firm to exercise market power and maintain its exclusivity has to be attributed to the existence of a barrier to entry, some factor that permits firms already in the market to earn monopoly profits, whilst deterring potential competitors from taking a decision to enter the industry.<sup>86</sup> Following the seminal work of Bain,<sup>87</sup> three typical market conditions may fall into this category: (1) absolute cost advantage, (2) product differentiation and (3) economies of scale. Absolute cost advantage allows incumbents to profitably price their product below the costs of potential entrants. Product differentiation enables incumbents to effectively charge prices higher than those charged by entrants, whilst economies of scale afford incumbents an advantage over any potential entrant who could penetrate the market at a lower rate of output. Consequently, all these market conditions permit incumbents to earn monopoly returns up to a certain extent without inducing entry.<sup>88</sup>

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83 *Id.*, at para. 20.

84 U.S. Merger Guidelines, at § 1.51.

85 Notably, the analysis of entry, considered by many economists at least as important as the level of concentration in predicting anti-competitive conduct, was not formalised in the first 1968 U.S. Merger Guidelines, and appeared as a separate stage only at the 1982/1984 Guidelines.

86 *E.g. Rebel Oil Co., Inc v. Atlantic Richfield Co.*, 51 F.3d 1421, 1439 (9th Cir. 1995): “high market share, though it may ordinarily raise an inference of monopoly power, will not do so in a market with low entry barriers”. See generally F.M. Scherer and D. Ross, *Industrial Market Structure and Economic Performance*, Houghton Mifflin Company (3<sup>rd</sup> ed., 1990), at Chapter 10; Church and Ware (2000), *op. cit.*, at 113-124; E. Gellhorn, W. Kovacic and S. Calkins, *Antitrust Law and Economics*, West (5<sup>th</sup> ed., 2004), at 138-139; Hovenkamp (2005), *op. cit.*, at 39-42.

87 Bain (1956), *op. cit.*

88 This latter view, associated with the Harvard School of thought, was not shared by Chicago scholars such as Stigler, Bork and Posner, who posited that most such factors are merely natural obstacles inherent to the nature of different industries, and should not raise antitrust concerns. As articulated by J. Stigler, *The Organization of Industry*, Homewood (1968), at 67, an entry barrier is “a cost of production (at some or every rate of production) which must be born by a firm which seeks to

Some entry barriers, such as scale economies and high fixed costs of initial investment, lead to the creation of ‘natural’ monopolies, whereby one firm supplies the entire market more cheaply and efficiently than several firms would do.<sup>89</sup> Another common source of entry barrier is legal, in the form of government regulation, e.g. price-regulated public utilities, such as electric companies and infrastructures.<sup>90</sup>

Contemporary conceptions of barriers to entry focus on the role of sunk costs, creating a competitive advantage to incumbents in comparison to entrants<sup>91</sup>. Considerable attention is also dedicated to strategic entry deterrence (e.g. raising rivals’ costs), resulting, for example, from excessive product differentiation, risk, cost of capital, advertising, or vertical integration.<sup>92</sup>

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enter an industry but is not borne by firms already in the industry’’. Following such a classification, economies of scale, for example, would not qualify as an entry barrier, as the costs of entry do not apply uniquely to newcomers. However, contemporary antitrust analysis generally follows the Bainian approach. See e.g. Case 27/76 *United Brands v. Commission* (1978), ECR 207, at para. 122 (“the particular barriers to competitors entering the market are the exceptionally large capital investments required ... the introduction of an essential system of logistics ... economies of scale from which newcomers to the market cannot derive any immediate benefit and the actual cost of entry made up inter alia of all the general expenses incurred in penetrating the market such as the setting up of an adequate commercial network, the mounting of very large-scale advertising campaigns, all those financial risks, the costs of which are irrecoverable if the attempt fails’’); Case C-85/76 *Hoffmann-La Roche v. Commission*, (1979) ECR 461, at para. 41 (“An undertaking which has a very large market share and holds it for some time, by means of the volume of production and the scale of the supply which it stands for – without those having much smaller market shares being able to meet rapidly the demand from those who would like to break away from the undertaking which has the largest market share – is by virtue of that share in a position of strength which makes it an unavoidable trading partner and which, already because of this secures for it, at the very least during relatively long periods, that freedom of action which is the special feature of a dominant position’’). Moreover, the EC Horizontal Merger Guidelines, at para 71(b), still qualify economies of scale per se as an entry barrier.

89 See e.g. Carlton and Perloff (2005), op. cit., at 104-105.

90 Id., at 102-103.

91 The fundamental importance of sunk costs has been addressed in the theory of contestable markets. J.C. Baumol and R. D. Willig, *Contestable Markets and the Theory of Industry Structure*, Harcourt College Publishers (1982). See also G. Werden, *Network Effects and Entry Conditions*, 69 *Antitrust Law Journal* 87, 100 (2001); Jones and Sufrin (2004), op. cit., at 75-6.

92 Korah (2004), op. cit., at 18; Hovenkamp (2005), op. cit., at 46. As demonstrated by various game-theoretic models, these factors are incorporated into potential entrants’ entry decisions, and may affect their evaluation of the profitability of entry, and ultimately their decision whether to take that step. See e.g. R. Schmalensee, *Entry Deterrence in the Ready-to-Eat Breakfast Cereal Industry*, 9 *Bell Journal of Economics* (1976); A.M. Spence, *Entry, Investment and Oligopolistic Pricing*, 8 *Bell Journal of Economics* 534 (1977); A. Dixit, *The Role of Investment in Entry-Deterrence*, 90 *Economic Journal* 95 (1980); S.C. Salop and D.T. Scheffman, *Raising Rivals’ Costs*, 73 *American Economic Review* 267 (1983); T.G. Krattermaker and S.C. Salop, *Antitrust Analysis and Anticompetitive Exclusion: Raising Rivals’ Costs to Achieve Power over Price*, 96 *Yale Law Journal* 209 (1986); T.G. Krattenmaker and S.C. Salop, *Analyzing Anticompetitive exclusion*, 56 *Antitrust Law Journal* 71 (1987); S.C. Salop and D.T. Scheffman, *Cost-Raising Strategies*, 36 *Journal of Industrial Economics* 19 (1987); D. Harbord and T. Hoehn, *Barriers to Entry and Exit in European Competi-*

The important point is that the existence of a barrier of some sort establishes the monopolist's independence to act freely in the market. In the absence of the barrier, firms outside the industry, recognising profit-making possibilities, will enter the industry and undermine the ability of the monopolist to elevate prices unilaterally, thereby eroding its dominance.

Notably, the structuralist approach to competition analysis places great importance on circumstantial evidence for the existence of market power. High levels of industry concentration or substantial barriers to entry only serve to suggest, rather than prove market power directly. Although legal and economic antitrust practitioners no longer believe that structure exclusively dictates performance, they do generally accept that structure affects the incentives of firms to behave anti-competitively. Hence, a structuralist analysis to competition law problems remains highly intact, probably thanks to its unsophisticated and coherent nature, even in places where practical alternatives attributed to recent advancements in econometrics and statistics are available. Prominent techniques which may outmode the indirect methodology are discussed in detail in the following chapters.

As a final observation, it is important to bear in mind the pitfalls associated with the structural approach to assessing market power. For the sake of workability, this framework has emerged as a response to the need to simplify the very complex nature of interaction between a number of unevenly located buyers and sellers, each having different costs, characteristics and preferences. It is therefore useful to remember that structure does not in itself dictate market performance, but is merely a prerequisite for any proof of anti-competitive conduct.

One recommendation in this context would be to avoid presumptions flowing from market share statistics. Most importantly, market shares are directly correlated to the way a market has been defined. If the relevant market is defined too narrowly, market shares will tend to overestimate the degree of market power among market participants, and will fail to take into account the importance of constraints outside the market boundaries. In contrast, if the market is defined too broadly, market shares will underestimate the potential for distortion of competition. Even if markets are correctly defined, the inherent in-or-out nature of market definition could mean that market share analysis alone

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tion Policy, 14 *International Review of Law and Economics* 411 (1994), at 413-15; T.J. Campbell, *Predation and Competition in Antitrust: The Case of Nonfungible Goods*, 87 *Columbia Law Review* 1625 (1987).

may overlook close competitors positioned just outside its scope,<sup>93</sup> or that it may overstate the competitive constraints between products.<sup>94</sup>

Additionally, the relevance of market shares and concentration indices is not only dependent upon the objectivity of the market definition in question, but also on the type of the anti-competitive effect encountered.<sup>95</sup> This is especially true in differentiated products markets, where in certain circumstances low post-merger market shares do not exclude the possibility that competition has been weakened, and that antitrust intervention is warranted. Moreover, in the presence of technological change and innovation, which radically alter existing industries or create new ones, market share analysis will convey little information as for the true extent of competition expected to emerge.<sup>96</sup>

A similar warning can be levied at the market definition exercise, which is discussed in detail in Chapter 3. Market definition should be viewed as a mere tool to identify and group together the main competitive forces relevant to the case at hand, but not as an end in itself.<sup>97</sup> Whereas competition law analysis heavily relies on market definition to launch the competitive assessment, several economic approaches would advocate its abandonment. The concept of free competition introduced by Hoppmann, for example, rejects the need for market definition in favour of *per se* rules, as a means of prohibiting the abuse of unreasonable market power.<sup>98</sup> Alternatively, the Schumpeterian concept of competitive rivalry, by which competition is viewed as a process of spontaneous coordination and

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93 Particularly in markets characterised by a high degree of product differentiation, the need to draw a clear line between products inside and outside the relevant market may lead to overestimation of the competitive pressures coming from brands 'in' the market, and underestimation of the pressures exerted by brands 'out' of the market. See M. Katz & H. Shelanski, *Mergers and Innovation* 74 *Antitrust Law Journal* 1 (2007).

94 For example, high market shares held by competitors may signal their strong position in terms of expanding sales and restraining prices, but only if the latter are unconstrained by limited capacity. Moreover, a monopolist on a contestable market (i.e. a market with no costs of entry or exit) may possess no market power whatsoever, contrast to a 100% market share. Furthermore, in some cases competitive threats originate from rivals not currently present in the marketplace, which may launch new innovative products ('competition for the market') but are not yet counted as market players. See also Bishop and Walker (2002), *op. cit.*, at 53-54.

95 Van den Bergh and Camesasca (2006), *op. cit.*, at 122.

96 D.R. Lee and R.B. McKenzie, *Technology, Market Changes and Antitrust Enforcement*, 37 *Society* 31 (2000); C. Veljanovski, *E.C. Antitrust in the New Economy: Is European Commission's View of the Network Economy Right?* 22 *European Competition Law Review* 115 (2001).

97 Faull and Nikpay (1999), *op. cit.*, at 50: "[T]he competitive constraints in a firm's market power are to an extent determined by the market forces in the given situation irrespective of how one organizes the products of the various firms in particular markets. Recognition of this evident point, however, also implies that a market defined in an arbitrary even if 'obvious' way is not an end in itself, and so cannot and should not conclusively determine the outcome of the competitive assessment".

98 E. Hoppmann, *Fusionskontrolle*, Tübingen: Mohr Siebeck (1972); E. Hoppmann, *Behinderungsmissbrauch* (1980). For further discussion see Van den Bergh and Camesasca (2006), *op. cit.*, at 89-90. See also A. Christiansen and W. Kerber, *Competition Policy with Optimally Differentiated Rules*

evolution, relegates any conclusions associated with structural indicators. It thus discards the legal prerequisite to delineate the relevant market, and the predictive value assigned to market shares.<sup>99</sup> Modern economic thinking further recognises that market definition may be avoided in those occasions where the availability of data permits that market power is measured directly.<sup>100</sup> Such inquiries, which focus on the competitive effect at hand rather than its form, may reduce the dependence on market definition as an intermediary stage.

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instead of 'Per Se Rules vs. Rules of Reason', 2 *Journal of Competition Law and Economics* 215, 220 (2006).

99 J.A. Schumpeter, *Capitalism, Socialism and Democracy*, Harper & Brothers (1942).

100 S.C. Salop, *The First Principles Approach to Antitrust, Kodak, and Antitrust at the Millenium*, 68 *Antitrust Law Journal* 187 (2000); L. Coppi and M. Walker, *Substantial Convergence or Parallel Paths? Similarities and Differences in the Economic Analysis of Horizontal Mergers in U.S. and EU Competition Law*, 49 *Antitrust Bulletin* 101 (2004), at 104-105.

## Chapter 3

# Market Definition

### 3.1 Introduction

Market definition plays a critical role in EC competition law, as the first step of any assessment of the nature of competition in a given industry. The main function of market definition is to identify in a systematic way the competitive pressures and constraints faced by the firms involved. These may include products and regions which are, or could potentially be, such close substitutes for one another in the eyes of consumers, that they restrain the behaviour of their suppliers.

The general problem with market definition is to decide which products should be included within the market, and which should be left outside its bounds. It is evident, for example, that airplanes and toothbrushes do not belong to one relevant market, but what about bananas and strawberries, or Kellogg's Special K and General Mill's Cheerios? Assessing the magnitude of substitution between closely-related products is often difficult, and does not yield clear-cut answers. Only considerable substitution between products, i.e. one that would induce a sufficient number of consumers to switch between products upon a change in conditions of sale, makes economic difference and therefore matters for the sake of antitrust analysis.

It should be acknowledged that market definition is not an end in itself. It is merely an intermediary tool whose objective is to restrict the attention to the actual competitors who are capable of effectively constraining the behaviour of the firms of interest, so that those firms could not act independently within the market.<sup>1</sup> A definition of a relevant market conveys meaningful information regarding market power, as it enables the calculation of market shares and the assessment of a dominant position in the market. It is from this perspective that market definition serves to establish a framework within which competition policy is applied by the European Commission.

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<sup>1</sup> For criticism of market definition see the discussion in Chapters 2 and 6, clarifying that not all economic approaches perceive the relevant market as indispensable.

The concept of the relevant market is now central to all decisions made under Article 81 and 82 EC, as well as the Merger Regulation. Under Article 81 EC, market definition is needed to establish whether an agreement, decision, or concerted practice at issue has in its object or effect the prevention, restriction or distortion of competition within the common market, or whether it qualifies for an individual or block exemption under Article 81(3). The Commission is thus obliged to define the market in order to find an agreement, decision or concerted practice liable to affect trade between Member States.<sup>2</sup>

Following the concept of dominance under Article 82 EC, economic power of a firm can be assessed only in relation to a relevant market, and the question whether a firm has abused its dominant position can be answered only after the relevant market has been delineated. A dominant position presupposes that a market has been identified, and an abuse of such position can be ascertained only with a given market definition in mind.<sup>3</sup>

Likewise, the substantive test under the Merger Regulation is whether a concentration “would significantly impede effective competition, in particular as a result of the creation or strengthening of a dominant position”.<sup>4</sup> The potential competitive concern here is twofold: a merger may boost the firm’s market share to such a degree that it would allow it to disregard its competitors, or it may render the post-merger market structure vulnerable to collusive behaviour. Each one of these scenarios cannot be fully investigated until the relevant market in which the merging firms operate has been determined.<sup>5</sup>

Market definition is a fundamental component of many other regulations, in particular those relying on market shares thresholds, such as the block exemption regulation on vertical agreements<sup>6</sup> or agreements of minor importance (*de minimis*).<sup>7</sup>

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2 Cases T-374/94, T-375/94, T-384/94 and T-388/94, *European Night Services v. Commission*, (1998) ECR II-3141, at para. 93-95, 105

3 J. Stuyck, M. Waelbroeck, B. L. P. van Reeken, S. B. Noë, *Competition Law in the EU and the Netherlands A Practical Guide*, W.E.J. Tjeenk Willink (2000), stating at 81: “There is no dominant position in the abstract. A dominant position only exists in relation to a specific market”.

4 Guidelines on the Assessment of Horizontal Mergers under the Council Regulation on the Control of Concentrations between Undertakings, OJ C 31/5 (2004) (hereinafter: “EC Horizontal Merger Guidelines”), at para. 1; Council Regulation (EC) No 139/2004 on the Control of Concentrations between Undertakings, OF L 24/1 (2004) (hereinafter: “EC Merger Regulation”), at para. 24: “a concentration with a Community dimension which creates or strengthens a dominant position as a result of which effective competition in the common market or in a substantial part of it would be significantly impeded should be declared incompatible with the common market”.

5 EC Horizontal Merger Guidelines, at para. 10: “The Commission’s assessment of mergers normally entails: (a) definition of the relevant product and geographic Markets”); Case T-342/99 *Airtours v. Commission*, (2002) ECR II-2585, at para. 19.

6 Council Regulation (EC) No 1215/1999 amending Regulation No 19/65/EEC on the Application of Article 81(3) of the Treaty to Certain Categories of Agreements and Concerted Practices, OJ L 148/1 (1999).

7 Commission Notice on Agreements of Minor Importance Which Do Not Appreciably Restrict Competition under Article 81(1) of the Treaty Establishing the European Community (*de minimis*), OJ C 368/13 (2001).



The key position of market definition in legal practice has been explicitly recognised in decisions of the European Court of Justice (ECJ) and the Court of First Instance (CFI), which have established the need to define the relevant market for all substantive competition law provisions. As elucidated by the ECJ:<sup>8</sup>

“The definition of the relevant market is of essential significance, for the possibilities of competition can only be judged in relation to those characteristics of the products in question by virtue of which those products are particularly apt to satisfy an inelastic need and are only to a limited extent interchangeable with other products”.

Similarly, the CFI has recently reiterated:<sup>9</sup>

“[T]he proper definition of the relevant market is a necessary precondition for any judgment as to allegedly anti-competitive behaviour, since, before an abuse of a dominant position is ascertained, it is necessary to establish the existence of a dominant position in a given market, which presupposes that such a market has already been defined”.

Nevertheless, whilst the above decisions illustrate the significance that European courts attach to the stage of market definition, they also stress that that the competitive assessment does not come to an end with the delineation of market boundaries. Competitive inquiries are typically concerned with whether effective competition is adversely affected by the anti-competitive conduct at issue, or, in the case of a merger, will be adversely affected. Such investigations do not revolve, *per se*, around the definition of the relevant market, but rather they serve as a first and preliminary step accompanied by further detailed analysis of market conditions.

Furthermore, it should be recognised that market definitions are often asymmetric, as a firm or a product may operate in more than one market. Depending on the starting point of the investigation, market definition may shift respectively to the anti-competitive concerns raised in a case. Hence, relevant markets must be defined anew with every case, as the Commission is not bound by its former market definitions.<sup>10</sup>

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8 Case 6/72 Europemballage Corp. and Continental Can Inc. v. Commission, (1973) ECR 215, at para. 32

9 Case T-62/98 Volkswagen AG v. Commission, (2000) ECR II-02707, at para. 230.

10 A. Jones and B. Sufirin, *EC Competition Law Text, Cases and Materials*, Oxford (2004), at 298 and 918; V. Korah, *Cases and Materials on EC Competition Law*, Hart (3<sup>rd</sup> ed., 2006), at 105; Joint cases

Typically, the inquiry commences with the product sold by the firm under investigation, and it is quite plausible therefore that the relevant market will differ if the starting point changes.<sup>11</sup> The analysis of mergers, for example, is essentially forward-looking, and does not refer to past behaviour. In the same way, different types of abuses under Article 82 may raise different competitive concerns, implying that the analysis may shift in perspective according to the nature of the conduct at hand. Moreover, merger cases revolve around whether the merged entity would likely raise prices above the *prevailing* price level, whereas allegations of abuse are judged against a different benchmark (ideally, the *effectively competitive* price level). Asking a different question may well yield different answers, and consequently market definitions are generally tailored to the competitive issue at hand.

As market definition has become an indispensable module of EC competition law, two important questions have emerged:

- (1) What qualifies a market for competition law purposes?
- (2) How exactly markets ought to be delineated?

The following chapter is dedicated to answering these questions. First, the chapter addresses the concept of an antitrust market, starting from its economic origins, and proceeding with its evolution in competition law. The chapter then

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T-125/97 and T-127/97 *The Coca-Cola Company and Coca-Cola Enterprises Inc. v. Commission*, (2000) ECR II-01733, at para. 81-82: “a finding of a dominant position by the Commission, even if likely in practice to influence the policy and future commercial strategy of the undertaking concerned, does not have binding legal effects ... Such a finding is the outcome of an analysis of the structure of the market and of competition prevailing at the time the Commission adopts each decision. The conduct which the undertaking held to be in a dominant position subsequently comes to adopt in order to prevent a possible infringement of Article 86 of the Treaty is thus shaped by the parameters which reflect the conditions of competition on the market at a given time. Moreover, in the course of any decision applying Article 86 of the Treaty, the Commission must define the relevant market again and make a fresh analysis of the conditions of competition which will not necessarily be based on the same considerations as those underlying the previous finding of a dominant position”.

11 S. Bishop and M. Walker, *The Economics of EC Competition Law: Concepts, Application and Measurement*, Sweet & Maxwell (2<sup>nd</sup> ed., 2002), at 125-126; C.G. Veljanovski, *Competition Law in the Computer Industry: An Economic Perspective*, 3 *Queensland University of Technology Law and Justice Journal* 3 (2003), maintaining at Part V, A: “[T]he appropriate definition of the market depends on the product or complaint under consideration, and varies on a case-by-case basis depending on the facts. For example, mainframe computers and PCs may at the same time be treated as one or two separate relevant product markets depending on the issue being considered. If one were examining market power in the mainframe sector, it may well be the case that PCs place a competitive constraint on the hypothetical monopolists’ ability to raise the price of mainframe computers. However, the opposite may not be the case since those who buy PCs and are subject to some alleged monopoly abuse by PC suppliers, may not regard mainframe computers as close substitutes, and will therefore not be able to substitute away from PCs. In this case, PCs will be a separate market from mainframe computers”.

goes on to assess the prevailing legal framework for the delineation of a relevant antitrust market.

## **3.2 What Qualifies for an Antitrust Market? The Concept of a Market in Economic and Legal Practice**

### **3.2.1 Antitrust Markets versus Economic and Strategic Markets**

Defining market boundaries is not an inherent precondition for organising economic activity. It is merely a practical tool used to classify activities for a certain purpose. Before turning to examine the market definition exercise undertaken in antitrust law, a preliminary point of interest concerns the basic unit of analysis. To define relevant markets, one has to define first what a market is.

There are many different ways to define markets, which do not necessarily coincide.<sup>12</sup> The concept of a market may differ significantly upon the context in which it is discussed. The way we think about market definition may shift according to the issue at hand. Thus, a market defined for the sake of competition analysis might differ significantly from a market defined for other purposes. Moreover, the understanding of an antitrust market is detached from other commonly used market classifications, such as an economic market, an industry, or a strategic market, since each one of these definitions subscribes to a distinct mode of analysis.

The classical definition of a market prevailing in economic theory was articulated by Marshall, who asserted that a market is not any particular marketplace in which things are bought and sold, but the whole of any region in which buyers and sellers engage in a free intercourse with one another, driving the price of the same goods to equality. Citing Cournot, Marshall set the rule:<sup>13</sup>

“Thus the more nearly perfect a market is, the stronger is the tendency for the same price to be paid for the same thing at the same time in all parts of the market”.

An economic market is the place where the interaction of suppliers, offering a good for money, and buyers, seeking to purchase that good, determines the price. In that vain, a given area will be considered an economic market if the price of

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12 P.A. Geroski, *Thinking Creatively about Markets*, 16 *International Journal of Industrial Organization* 677 (1998); R.J. Van den Bergh and P.D. Camesasca, *European Competition Law and Economics: A Comparative Perspective*, Sweet & Maxwell (2<sup>nd</sup> ed., 2006), at 114-118; G.J. Werden, *The History of Antitrust Market Delineation*, 76 *Marquette Law Review* 123 (1992).

13 A. Marshall, 1 *Principles of Economics*, Macmillan (9th ed., 1961), at 325.

the good in that area tends towards uniformity (allowance being made for transportation costs). Such a market consists of an area of relatively homogeneous demand, within which product prices are linked to one another by supply-side and demand-side arbitrage, and those prices can be treated independently of prices of goods not in the market.<sup>14</sup>

Suppose, for example, a commodity A is sold at a given price X across a region. The fact that the price remains uniform in this region must mean that buyers and sellers consider all transactions within this region as perfect substitutes. Any attempts of buyers or sellers to deviate from the equilibrium price X will be defeated due to the existence of perfect substitutes that will push the price down to X again. Hence this region constitutes an economic market.

Defining an economic market seems feasible in theory, but much more confusing in practice. Actual markets rarely consist of homogeneous products produced at a single location, and for which there are no substitute products or locations outside the market. Almost all real-life products essentially vary in one or more dimensions (e.g. quality, brand recognition, consumer perception), and isolating the boundaries within which a single price prevails is often intricate.

Moreover, whilst economic markets and antitrust markets are certainly related, there are several reasons why they do not always overlap. Whereas an economic market concerns an 'island' of distinctive type of activity, for which a single price is assigned, an antitrust market may encompass a variety of activities. Those may take place at different locations and at different prices, and supplied by a range of competitors, as long as the most significant competitive constraints between the above products and regions are identified and isolated. Therefore, an antitrust market may match, be wider or narrower than the economic market. Consider, for example, the market for low-priced computer servers. Whereas an economic market definition might categorise servers priced at \$100,000 as a distinct market, an antitrust market definition will have to acknowledge the possible restraining effect of higher-priced servers on the price of the cheaper ones. Grouping all servers within a similar price category may fit the textbook economic model, but will fail to account for potential consumer migration to other products (sold maybe at higher price, but also reflecting better performance) on the occasion of a price increase.

The classical economic understanding of a market has shifted dramatically throughout the first half of the 20<sup>th</sup> century with the emergence of the new

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14 G.J. Stigler and R.A. Sherwin, *The Extent of the Market*, 28 *Journal of Law & Economics* 555 (1985); D.T. Scheffman and P.T. Spiller, *Geographic Market Definition under the U.S. Department of Justice Merger Guidelines*, 30 *Journal of Law and Economics* 123, 125 (1987).

theories on ‘monopolistic competition’, celebrated at the time. These theories induced certain hostility towards the former single-price property of a market, recognising that the traditional definition did not closely correspond to the real world. Monopolistic competition theories accounted for the significant role of product differentiation, which made every seller a monopolist over its particular product, to a certain extent. Moreover, it was argued that market boundaries were a meaningless delusion, and that attempts to arbitrarily draw boundaries would have false implication both as to competition between substitutes, and as to the possibility of counting the number of producers included in the market, or discriminating between firms that are in and out of a market.<sup>15</sup> This evolution in economic thinking emerged following earlier realisations of prominent economists in the field of industrial organization, asserting that the market for any firm consists of the group of firms it views as its significant competitors.<sup>16</sup> In sharp contrast to the classical view, markets were now thought to be defined with reference to the position of a single seller, so that the structure of the seller’s market included all the considerations which affected his business practices. That is, all buyers and sellers, of whatever product, whose actions influenced his volume of sales.

A closely related ‘real life’ approach to identifying market boundaries was promoted by the ensuing work of Bain and the Harvard School economists, who attempted to focus empirical investigations on entire industries. Those were defined by Bain in 1951 as a group of products featuring high cross-price elasticities with each other, but low cross-price elasticities with other products.<sup>17</sup> Acknowledging that in the real world products are seldom ‘perfect substitutes’ for each other, and moreover that substitutability is a matter of degree, Bain explained:<sup>18</sup>

“Each seller of a slightly different good should not be put in a separate “industry” when his price changes in fact tend strongly to influence the sales of a number of close substitute products. The definition of an industry is thus conveniently expanded so that an industry may include not only identical or perfect substitute products but alternatively close substitute products ... The industry includes a range of close-substitute products so defined; it excludes any product the demand for which is not significantly influenced by the industry’s price changes”.

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15 E.H. Chamberlin, *Product Heterogeneity and Public Policy*, 40 *American Economic Review* (Papers & Proceedings) 85 (1950), at 86-87.

16 E.S. Mason, *Price and Production Policies of Large-Scale Enterprises*, 29 *American Economic Review* (Papers & Proceedings) 61, 69 (1939).

17 J.S. Bain, *Relation of Profit Rate to Industry Concentration: American Manufacturing*, 65 *Quarterly Journal of Economics* 293 (1951).

18 J.S. Bain, *Price Theory*, Wiley (1952), at 24-25.

Bain's concept of an industry highlighted the idea of interdependence between products. His definition attempted to limit the scope of the chain of substitution and narrow down the market to include only meaningful substitutes, while leaving out negligible substitutes. In order to distinguish significant from insignificant interdependence, Bain reinforced the notion of cross-price elasticity as an important criterion for establishing market boundaries. Most importantly, Bain's view on markets furthered the departure of antitrust analysis from its traditional economic origins, by recognising that an antitrust market is simply the place 'where the battle is fought'.<sup>19</sup>

Antitrust markets should not be confused with another concept of a market prevalent today, namely a strategic market, which commonly surfaces in the marketing literature.<sup>20</sup> Strategic markets comprise consumer groups and geographic territories at which marketing activities are targeted, for instance, areas that are subject to similar sales methods, distribution techniques, promotion schemes and advertising efforts. Defining such markets typically involves identifying the characteristics of the product or service on offer, recognising needs and functions, and constructing a list of relevant people and places to be addressed. Although the interest in relevant regions and products may somewhat resemble that of antitrust markets, the result may very well differ.

Consider, for example, the market for Coca-Cola. A strategic perspective that accounts for consumer buying patterns, might indicate that the market is as wide as European, or even worldwide. An antitrust point of view, however, hinges on the crucial question how purchasing behaviour of Coca-Cola customers changes in response to changes in its price. Through this lens, market definition may change drastically and may be much more localised. Strategic markets therefore may or may not coincide with antitrust markets, and it is quite possible that a strategic market will be much wider than the relevant antitrust market.

### **3.2.2 The Emergence of the Relevant Market Definition Methodology**

Together with the abovementioned economic contributions to the concept of an antitrust market, much of the emergence of relevant market definition as a coherent methodology has to be accredited to the U.S. legal practice, governed by prominent Supreme Court precedents.<sup>21</sup> Courts typically addressed market

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19 Van den Bergh and Camesasca (2006), *op. cit.*, at 115.

20 See generally P. Kotler, *Marketing Management*, Pearson Prentice Hall (2006).

21 Werden (1992), *op. cit.*; J.J. Simons and M.A. Williams, *The Renaissance of Market Definition*, 39 *Antitrust Bulletin* 799 (1993); R. Pitofski, *New Definitions of Relevant Market and the Assault on Antitrust*, 90 *Columbia Law Review* 1805 (1990). See also P. Massey, *Market Definition and*

definition in relation to mergers and acquisitions challenged under Section 7 of the Clayton Act,<sup>22</sup> and in cases arising under Sections 1 and 2 of the Sherman Act.<sup>23</sup>

The earliest<sup>24</sup> U.S. Supreme Court decision to offer some principles for market delineation was *Times-Picayune*, where the court recognised that the key to market definition is substitution:<sup>25</sup>

“for every product, substitutes exist. But a relevant market cannot meaningfully encompass that infinite range. The circle must be drawn narrowly to exclude any other product to which, within reasonable variations in price, only a limited number of buyers will turn”.

The court further borrowed cross-price elasticity of demand from economic theory, and declared it to be the relevant test in assessing the closeness of substitution.<sup>26</sup>

The subsequent important discussion over market definition appeared in the famous 1953 *Cellophane*<sup>27</sup> monopolisation case. The case concerned du Pont, an exclusive cellophane producer, which accounted for three-quarters of the sales of cellophane in the United States, and was allegedly abusing its market power. Of primary value in this decision were the court’s remarks concerning the relevance of market delineation:<sup>28</sup>

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Market Power in Competition Analysis: Some Practical Issues, 31 Economic and Social Review 309 (2000).

22 Section 7 of the Clayton Act, 15 USC 18 (1988), prohibits mergers and acquisitions which may substantially lessen competition, in any line of commerce and in any section of the country.

23 Section 1 of the Sherman Act, 15 USC 1 (1988), prohibits agreements that unreasonably restrain trade, including certain vertical restraints. Section 2 of the Sherman Act, 15 USC 2 (1988), prohibits monopolisation, attempts to monopolise, and conspiracies to monopolise.

24 The earliest usage of the term ‘relevant market’ in a reported federal antitrust decision was the merger case *United States v. Columbia Steel Co.*, 334 U.S. 495, 508 (1948). The court recognised, however, the difficulty of laying down a rule as to what areas or products are competitive, one with another. This motivated in part the 1950 amendment of Section 7 of the Clayton Act, which explicitly introduced market definition into the process. Werden (1992), *op. cit.*, at 129-130.

25 *Times-Picayune v. United States*, 345 U.S. 594 (1953), at 612, n. 31.

26 The first explicit proposal to base market definition on cross-elasticity of demand appeared a year earlier, in *Bain* (1952), *op. cit.*, at 25-26, 50-53 and F. Machlup, *The Economics of Sellers’ Competition*, Baltimore (1952), at 213-214.

27 *United States v. E. I. Du Pont de Nemours*, 351 U.S. 377 (1956). See also the discussion of the case in D.F. Turner, *Antitrust Policy and the Cellophane Case*, 70 *Harvard Law Review* 281 (1956).

28 *Id.*, at 380-381

“Market delimitation is necessary ... to determine whether an alleged monopolist violates § 2. The ultimate consideration in such a determination is whether the defendants control the price and competition in the market for such part of trade or commerce as they are charged with monopolizing. Every manufacturer is the sole producer of the particular commodity it makes but its control in the above sense of the relevant market depends upon the availability of alternative commodities for buyers: i. e., whether there is a cross-elasticity of demand between cellophane and the other wrappings. This interchangeability is largely gauged by the purchase of competing products for similar uses considering the price, characteristics and adaptability of the competing commodities”.

Moreover, the court observed that “if cellophane is the “market” that du Pont is found to dominate, it may be assumed it does have monopoly power over that “market””.<sup>29</sup> The court thus established the link between market definition and market power, and highlighted the need to define market boundaries prior to finding market power.

More specifically, the market definition test purported by the court in *Cellophane* entailed two components. First, an appraisal of the cross-price elasticity of demand between the product in question and its possible substitutes, and second, a consideration of the ‘reasonable interchangeability’ between them. These criteria dictated that every relevant market composed of products that were interchangeable for consumers, considering their purpose, price, use and quality.<sup>30</sup> Following this line of reasoning, the court concluded that cellophane encountered sufficient competition from other packaging materials, and hence did not constitute a relevant market on its own.<sup>31</sup>

A year later in 1957, the U.S. Supreme Court was summoned to address market definition issues again, albeit in the context of mergers. The decision concerned a vertical merger, *du Pont/General Motors*,<sup>32</sup> companies which operated in the automotive finishes and fabrics industry. In contrast to the extensive discussion on market definition held in *Cellophane*, the Supreme Court refrained from further elaboration, and defined the market very narrowly to include only automotive (rather than all industrial) finishes and fibres, within which the merging parties were significant competitors. Not only did the court omit the rationale for such a narrow definition given the broad market found in *Cellophane*, but it

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29 Id., at 391.

30 Id., at 394-395, 404.

31 The Court decision was heavily criticised. A detailed analysis of the notorious ‘cellophane fallacy’ ensues below.

32 United States v. E.I. Du Pont de Nemours, 353 U.S. 586 (1957).



also applied a test of ‘peculiar characteristics and uses’ as its market delineation standard, seemingly abandoning the principles developed shortly before.

The obscurity of that decision brought about much scepticism with respect to the validity of market definition. The main line of criticism centred on whether a single definition of a market is appropriate for different instances and under different legal provisions, and moreover, whether a market definition for monopolisation cases is appropriate also for merger cases.<sup>33</sup>

In a different case of a horizontal merger between dominant U.S. steel producers, a federal court defined eleven different relevant product markets, some of which were congruent, and delineated five levels of concentric geographic markets, hence dismissing the single Cellophane standard, which called for appreciation of substitution possibilities within one purported market.<sup>34</sup> Additional cases during that period also tended to shift from the Cellophane ideology, by seeking guidance on market definition primarily from du Pont/General Motors.<sup>35</sup>

The perplexity of market definition was re-addressed in 1962 by the U.S. Supreme Court in the case of *Brown Shoe*.<sup>36</sup> In a majority decision, the court had the opportunity to settle the conflicting interpretations of former decisions, and to clear up some of the ambiguity surrounding market delineation, thereby setting an important precedent. To begin with, the court formulated the test for market definition as follows:<sup>37</sup>

“The outer boundaries of a product market are determined by the reasonable interchangeability of use or the cross-elasticity of demand between the product itself and substitutes for it. However, within this broad market, well-defined submarkets may exist which, in themselves, constitute product markets for antitrust purposes”.

Moreover, the court introduced seven ‘practical indicia’ to be used for the determination of such possible submarkets. These included industry or public recognition of the submarket as a separate economic entity, the product’s peculiar characteristics and uses, unique production facilities, distinct customers, distinct prices, sensitivity to price changes, and specialised vendors.

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33 I.R. Barnes, *Competitive Mores and Legal Tests in Merger Cases: The Du Pont-General Motors Decision*, 46 *Georgetown Law Journal* 564, 603 (1958); J.B. Dirlam and I.M. Stelzer, *The Du Pont-General Motors Decision: In the Antitrust Grain*, 58 *Columbia Law Review* 24 (1958), at 39-40.

34 *United States v. Bethlehem Steel Corp.*, 168 F. Supp. 576 (SDNY 1958).

35 *In re Reynolds Metals Co.*, 56 FTC. 743 (1960), *aff’d*, 309 F.2d 223 (DC Cir. 1962); *In re A.G. Spalding & Bros., Inc.*, 56 FTC 1125 (1960), *aff’d*, 301 F.2d 585 (3d Cir. 1962).

36 *Brown Shoe v. United States*, 370 U.S. 294 (1962).

37 *Id.*, at 325.

It was not clear from the court decision, however, how exactly and where the borderlines of the relevant market should be drawn. With respect to the issue at hand, the court concluded that men's, women's and children's shoes belonged to separate markets, as each constituted a relevant line of commerce recognised by the public, each was manufactured in a separate plant, each had peculiar characteristics and each was directed towards a distinct class of customers. In this way, the court chose to ignore further price/quality distinctions within each particular group, although one of its practical indicia was, in fact, distinct prices. Though stating that the boundaries of the relevant market must be drawn with sufficient breadth to include the competing products and to recognise competition where it exists, it provided no consistent method for how this was to be done in practice. It seemed 'unreasonable' in the eyes of the court to separate men's shoes sold below \$8.99 from those sold above \$9, but the essential problem – that there would always remain competition at the margins wherever the line is drawn – remained untreated.<sup>38</sup>

What appears to be lacking in the Brown Shoe reasoning was a coherent framework in which all substitution possibilities could be systematically assessed and accounted for. The introduction of the seven practical indicia was valuable in that it listed the relevant criteria that separated one distinct market from another. However, the indicia were inconclusive and imprecise with respect to market boundaries, and largely required subjective evaluation. Market definitions based on public recognition or product characteristics were thus unlikely to be unambiguous, and could be easily manipulated to support a particular outcome.<sup>39</sup>

Equally vexing was the concept of a submarket presented by the court, which seemed to lack economic reasoning.<sup>40</sup> In *United States v. Continental Can*,<sup>41</sup> for example, the submarket concept was employed to justify a market definition for antitrust purposes comprising metal and glass containers, despite recognition in a broader market for containers (including also plastic, paper foil and other types of containers). Most importantly, the essential question after Brown Shoe, how to limit the scope of the relevant market to significant substitutes only, was left open.

In 1968, the U.S. Department of Justice promulgated the first Merger Guidelines.<sup>42</sup> The principle for market delineation under the Guidelines was to identify

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38 Werden (1992), *op. cit.*, at 158.

39 J.A. Keyte, Market Definition and Differentiated Products: The Need For A Workable Standard, 63 *Antitrust Law Journal* 697, 699 (1995).

40 On the irrelevance of the submarket concept generally see H. Hovenkamp, *Federal Antitrust Policy, The Law of Competition and Its Practice*, Thomson/West (3<sup>rd</sup> ed., 2005), at 87-90.

41 *United States v. Continental Can Co.*, 378 U.S. 441 (1964), at 457-458.

42 U.S. Department of Justice Merger Guidelines, 4 *Trade Reg. Rep.* (CCH) 13, 101 (1968).

the group of products and areas that had some tangible competitive advantage over those excluded from it.<sup>43</sup> The Guidelines referred neither to the concept of submarkets, nor to the practical indicia, but on the other hand did not contain any specific criteria to establish what might be considered as a meaningful product and geographic relevant market. With no clear guidance on how markets ought to be defined, during the two decades preceding the introduction of the 1982 Merger Guidelines, courts continued to resort to submarkets and to the practical indicia. Submarkets were commonly invoked by plaintiffs (especially government enforcement agencies) to narrow down the market and declare the merger unlawful. Practical indicia were typically used to validate a purported submarket.<sup>44</sup>

However, some notable statements of prominent commentators in this period mark a development in the perception of antitrust markets and its definition. In 1977, Lawrence Sullivan argued in his famous treatise:<sup>45</sup>

“To define a market in product and geographic terms is to say that if prices were appreciably raised or volume curtailed for the product within a given area, while demand held constant, supply from other sources could not be expected to enter promptly enough and in large enough amounts to restore the old price or volume. If sufficient supply would promptly enter from other geographic area, then the “defined market” is not wide enough in geographic terms; if sufficient supply would promptly enter in the form of products made by other producers which had not been included in the product market as defined, then the market would not be wide enough in defined product terms. A “relevant market”, then, is the **narrowest market** which is wide enough so that products from adjacent areas or from other producers in the same area cannot compete on substantial parity with those included in the market” (emphasis added).

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43 Or in the Guidelines phrasing, §3 states:” A market is any grouping of sales (or other commercial transactions) in which each of the firms whose sales are included enjoys some advantage in competition with those firms whose sales are not included. The advantage need not be great, for so long as it is significant it defines an area of effective competition among the included sellers in which the competition of the excluded sellers is, **ex hypothesi**, less effective”.

44 E.g. *General Foods Corp. v. FTC*, 386 F.2d 936, 943 (3<sup>rd</sup> Cir. 1967); *Beatrice Foods Co. v. FTC*, 540 F.2d 303, 308 (7<sup>th</sup> Cir. 1976); *Avnet, Inc. v. FTC*, 511 F.2d 70, 72, 77 (7<sup>th</sup> Cir. 1975); *Photovest Corp. v. Fotomat Corp.*, 606 F.2d 704, 713 (7<sup>th</sup> Cir. 1977). For a detailed overview see Werden (1992), *op. cit.*, at 172-184. As subtly articulated by Donald Turner in 1980, “this whole area is a bloody mess”. See D.F. Turner, *The Role of the “Market Concept” in antitrust Law*, 49 *Antitrust Law Journal* 1145, 1150 (1980).

45 L.A. Sullivan, *Handbook of the Law of Antitrust*, West (1977), at 41.

Likewise, Areeda and Turner contended in 1978:<sup>46</sup>

“In economic terms, a “market” embraces one firm or any group of firms which, if unified by agreement or merger, would have market power in dealing with any group of buyers”.

These proclamations were important in that they attributed market power to the group of firms included in the market definition. Moreover, they implied that the market delineation process is an essential aid for determining where and whether such power exists. Yet the fundamental question persisted: what degree of market power should be the appropriate subject of antitrust concern? Several suggestions crystallised in antitrust scholarship during that period. For example, Areeda and Turner argued that a one percent price increase imposed by the monopolist is too small, five percent probably enough, and ten percent clearly more than needed to establish that the firm or group of firms possess market power.<sup>47</sup> The economist Werden suggested in 1981 a ten to twenty percent increase to qualify for the significance threshold.<sup>48</sup>

The ambiguity surrounding the question of market definition was drastically dissolved following the release of the revised Merger Guidelines in 1982<sup>49</sup> and 1984,<sup>50</sup> which for the first time offered a complete analytical framework for identifying and eliminating mergers that have the power to create or enhance market power.<sup>51</sup>

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46 P.E. Areeda and D.F. Turner, *2 Antitrust Law: An Analysis of Antitrust Principles and Their Application*, Little (1978), at 347.

47 *Id.*

48 G.J. Werden, *The Use and Misuse of Shipments Data in Defining Geographic Markets*, 26 *Antitrust Bulletin* 719, 721 (1981).

49 U.S. Department of Justice Merger Guidelines, 4 *Trade Reg. Rep. (CCH)* 13, 102 (1982).

50 U.S. Department of Justice Merger Guidelines, 4 *Trade Reg. Rep. (CCH)* 13, 103 (1984) (hereinafter: “1984 U.S. Merger Guidelines”). There are slight differences between the two versions. The foregoing discussion will refer to the 1984 Guidelines.

51 G.J. Werden, *The 1982 Merger Guidelines and the Ascent of the Hypothetical Monopolist Paradigm*, (June 4, 2002). Available at: <http://www.usdoj.gov/atr/hmerger/11256.pdf>; G.J. Werden, *Market Delineation under the Merger Guidelines: A Tenth Anniversary Retrospective*, 38 *Antitrust Bulletin* 517 (1993); C.A. James, Assistant Attorney General, Antitrust Division U.S. Department of Justice, *Giant Steps, Remarks on the occasion of the Twentieth Anniversary of the 1982 Merger Guidelines* (June 10, 2002). Available at: <http://www.usdoj.gov/atr/hmerger/11253.htm>; D. Scheffman, M. Coate and L. Silvia, *Twenty Years of Merger Guidelines Enforcement at the FTC: An Economic Perspective*, Bureau of Economics, Federal Trade Commission, Paper presented in the Twentieth Anniversary of the 1982 Merger Guidelines (June 10, 2002). Available at: <http://www.usdoj.gov/atr/hmerger/12881.htm>.

The Guidelines identified three sources restricting the ability of a firm with market power to exercise it: (i) demand substitutability; (ii) supply substitutability, and (iii) entry, each addressed in a consecutive step. Demand substitutability relates to the willingness of consumers to switch to alternative products or regions on the occasion of a price increase, and is considered the primary concern of market definition. Supply substitutability and entry relate to the ability of competing producers, not yet selling the products in question, to change their production facilities and start selling the above products. The mere difference between entry and supply substitution, according to the Guidelines, is that entry would entail significant new investment in production and distribution, or would take more than one year to accomplish.<sup>52</sup>

The Guidelines launched a novel perception of an antitrust market, composed of a product and area, rather than a group of firms. Moreover, the Guidelines equated antitrust markets primarily with demand substitutability. This implied that in most cases, the investigation would focus on firms that currently produce and sell the relevant product. Additional firms not yet producing the product may be accounted for if their inclusion would more accurately reflect probable supply responses. Those firms were such that typically possessed appropriate production and distribution facilities, and who could easily and economically start producing the relevant product in response to its price increase. The Guidelines separated, however, demand from supply responses, by first defining the product and geographic markets according to demand substitutability, and further incorporating short-term supply reactions at a second stage, when identifying all firms that participate in the production of the relevant product.<sup>53</sup>

Consider, for example, a proposed merger between two beer producers. The relevant market under the Guidelines' approach would include only potential substitutes in the demand for beer (e.g. wines). However, soft drinks companies not currently selling beer could be identified as market participants and assigned market shares, provided that they are capable of switching to beer production in the timely manner set by the Guidelines. In that way, a market defined according to the Guidelines encompassed all factors that had meaningful power to restrain the exercise of market power.<sup>54</sup>

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52 1984 U.S. Merger Guidelines, at §2.21 and §3.3.

53 While this separation is somewhat implicit in the 1984 Guidelines, the ensuing 1992 and 1997 Guidelines already state explicitly that market definition's sole focus is demand substitution. Werden (1993), *op. cit.*, at 524-527, advocates this approach.

54 Note that the EU opted for a different approach in its Commission Notice on the Definition of the Relevant Market for the Purposes of Community Competition Law, OJ C 372/5 (1997) (hereinafter: "1997 Notice"). According to the Notice, as further discussed, the product market could comprise any meaningful substitute, both in demand and in supply. In the example above, a product market

A third source of less-immediate competition, namely potential suppliers who could not readily convert their facilities from the production of one product to another, would only be considered at a later stage of the assessment, when evaluating entry conditions generally.

With respect to the practical formation of the relevant market, the Guidelines officially introduced an economic oriented test for establishing market boundaries:<sup>55</sup>

“In general, the Department will include in the product market a group of products such that a hypothetical firm that was the only present and future seller of those products (a “monopolist”) could profitably impose a “small but significant and nontransitory” increase in price. That is, assuming that buyers could respond to an increase in price for a tentatively identified product group only by shifting to other products, what would happen? If readily available alternatives were, in the aggregate, sufficiently attractive to enough buyers, an attempt to raise price would not prove profitable, and the tentatively identified product group would prove to be too narrow”.

Rather than relying on qualitative indicators, which were susceptible to potential manipulations by the advocating parties or differing interpretations by the courts,<sup>56</sup> the Guidelines presented an innovative approach to the issue of market definition by applying a quantitative solution to a legal problem. The so-called *hypothetical monopolist* or *SSNIP*<sup>57</sup> test initiated by the Guidelines identifies the source of significant market power within an industry, by asking whether a profit-maximising price increase for a hypothetical monopolist over a group of product, would be at least 5% for at least one year.<sup>58</sup>

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defined in line with the U.S. approach would include only beer and wine (if the latter constitutes a meaningful substitute in demand), but not soft drinks (although soft drinks companies can potentially switch to the production of beer). In an equivalent EU analysis, soft drinks would be included in the product market definition.

55 1984 U.S. Merger Guidelines, at §2.11. The definition of the 1982 Guidelines was in the same spirit, stating: “a market consists of a group of products and an associated geographic area such that (in the absence of new entry) a hypothetical, unregulated firm that made all the sales of those products in that area could increase its profits through a small but significant and non-transitory increase in price (above prevailing or likely future levels)”. See U.S. DOJ Merger Guidelines, 4 Trade Reg. Rep. (CCH) 13, 102 (1982), at footnote 6.

56 A common accusation on U.S. government antitrust enforcers prior to the publication of the Guidelines was of arbitrarily manipulating markets to be wide enough, so that merging firms would be considered competitors, but narrow enough to make the market appear highly concentrated. See J.R. Morris and G.R. Mosteller, *Defining Market for Merger Analysis*, 36 *Antitrust Bulletin* 599 (1991).

57 SSNIP stands for Small but Significant and Non-transitory Increase in Price.

58 The test was aimed both at product and geographic market definitions. See 1984 U.S. Merger Guidelines, at §2.11 and §2.31.

To exemplify the implementation of the test, consider a dairy product industry consisting of 3 different brands of butter, 2 different brands of margarine and 3 types of cheeses. Upon an attempted merger between two of the butter producers, a market definition investigation would have to begin with the products of the two merging parties, and to consider whether a profit maximising hypothetical monopolist over the two brands of butter could profitably impose a 5% permanent price increase. If the answer is affirmative (namely the profit-maximising price increase for the hypothetical monopolist is greater than 5%) then the two brands constitute a relevant market for antitrust purposes. If, on the other hand, the answer is negative (e.g. the profit-maximising price increase for the hypothetical monopolist is only 3%), then apparently considerable competition originating from outside the tentative market is able to restrict the profitability of the hypothetical price rise, and the market would have to be broadened to include the third brand of butter, or alternative dairy products.<sup>59</sup>

The 1982/1984 Guidelines pioneered the idea of the hypothetical monopolist as the focal point for merger analysis. Its greatest contribution is thought to be the framing of the market definition question within a single coherent methodology, and providing a solid theory upon which market definition could be discussed and appraised.

The subsequent 1992<sup>60</sup> and 1997<sup>61</sup> Guidelines introduced additional refinements,<sup>62</sup> whilst maintaining the test's supremacy as the cornerstone of

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59 Note that a common misunderstanding of the SSNIP test is to ask whether a 5% percent price increase would be profitable for the hypothetical monopolist, rather than whether a profit-maximising price increase for the hypothetical monopolist would be at least 5%. In the above example, although the profit-maximising price increase is 3%, it is still possible that a 5% price increase would increase the monopolist's profit compared to its original level (at pre-merger prices). This however is not the correct implementation of the test. See Werden (1993), *op. cit.*, at 537-539. Additional issues concerning the implementation of the test are addressed in G.J. Werden, *Four Suggestions on Market Delineation*, 37 *Antitrust Bulletin* 107 (1992).

60 U.S. Department of Justice Merger Guidelines, 4 Trade Reg. Rep. (CCH) 13, 104 (1992).

61 U.S. Department of Justice and the Federal Trade Commission Horizontal Merger Guidelines, 57 Fed. Reg. 41552, reprinted in 4 Trade Reg. Rep. (CCH), 104 (1992, revised April 1997) (hereinafter: "U.S. Merger Guidelines").

62 For example, the 1992 Guidelines changed the time period for a price increase from one year to "the foreseeable future". Most importantly, those Guidelines also presented into the analysis the assumption that terms of sale of all other products (but for the hypothetical monopolist's) are to be held constant, see §1.0, §1.11 and §1.21. Economically speaking, the 1992 Guidelines retreated from the concept of residual demand - applied by the 1982/1984 Guidelines - to define relevant markets. The residual demand elasticity measures the extent to which a firm would be able to raise price by reducing output, after accounting for competitive or cooperative responses of rivals selling demand substitutes (for elaboration on this concept, see Chapter 2), and is generally regarded the relevant measure for directly assessing the combined influence of demand and supply substitution on the potential exercise of market power. The 1992/1997 Guidelines, in light of the assumption above,

market definition and the primary algorithm for its assessment. Largely thanks to the persistence of the hypothetical monopolist notion, the test and its analytical rationale have gathered far-reaching influence outside the U.S., and became acknowledged as the market definition standard for competition law issues in a large number of legal systems. The diffusion of this methodology to Europe and its practical implementation is the primary interest of the discussion in subsequent parts of this chapter.

### **3.3 Antitrust Market Delineation in the EC – Theory and Practice**

#### **3.3.1 Introduction**

The definition of the relevant market was already considered to be essentially significant in early European merger and monopolisation cases. The compatibility of a particular concentration with the common market, or the existence of a dominant position could be appraised only with respect to a relevant market affected by the transaction in question. Under Community law prior to 1997, two primary factors had to be considered in defining the relevant market, both its product and geographic dimension: substitutability in demand and substitutability in supply.

Following the concept of substitutability developed by the European Court of Justice in the application of Articles 81 and 82 (ex Articles 85 and 86), the European Commission generally equated the relevant product market with demand side considerations, comprising all products or services that were deemed interchangeable by consumers, by virtue of their characteristics, prices and intended use,<sup>63</sup> although supply side considerations – the extent to which alternative suppliers could readily switch their resources so as to produce and supply demand substitutable products – were in some cases also part of the assessment.<sup>64</sup>

Similarly, the relevant geographic market was the area in which the conditions of competition applying to the product concerned were homogenous for all traders.<sup>65</sup> However, the relevant geographic market was time and again defined by

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imply that market definition proceeds through the estimation of a structural rather than residual demand elasticity (i.e. the own-price elasticity of demand, discussed in Chapter 2), which accounts only for the role of demand substitution in controlling a firm's ability to exercise market power.

63 Regulation 2367/90 On the Notifications, Time Limits and Hearings Provided For in Council Regulation (EEC) No. 4064/89 on the Control of Concentration between Undertakings OJ L 219/5 (1990), Form CO section 5.

64 E.g. Case IV/M.053 *Aerospatiale-Alenia/de Havilland*, (1991) OJ L 334/42, at para. 14; Case 6/72 *Europemballage Corp. and Continental Can Inc. v. Commission*, (1973) ECR 215.

65 Regulation 2367/90 On the Notifications, Time Limits and Hearings Provided For in Council Regulation (EEC) No. 4064/89 on the Control of Concentration between Undertakings OJ L 219/5 (1990), Form CO section 5.



reference to the area where an alleged abuse took effect, or to national factors (e.g. trade barriers, transport costs, price variations) that differentiated Member States.<sup>66</sup>

In the absence of a precise test determining the sufficient degree of substitutability between products or regions, it was left to the Commission and the European courts to establish a measure of relevance for evidence concerning market characteristics. Market delineation was hence contingent to a large extent on judicial discretion, and built upon case-law precedents.<sup>67</sup>

This situation changed with the promulgation of the European Commission's 1997 Notice on market definition. The Notice was published with the aim of increasing the transparency of the Commission's decision-making in the area of competition policy, whilst highlighting the sort of information pertinent, in the view of the Commission, for the purposes of market delineation. Its main goal was hence to provide guidance as to how the Commission applies the concepts of the relevant product and geographic markets.<sup>68</sup> The Notice further formalised the criteria upon which the Commission and the courts should base the market definition exercise, as well as established for the first time a coherent framework for the assessment of market power within the European Community.

In many respects, the publication of the Notice was thought to signal the modernisation of antitrust enforcement in the EU, as it ostensibly improved the methods employed in the market definition exercise. The Notice cites a large array of evidence and more sophisticated analytical measures valuable to market delineation, and goes well beyond the simplistic analysis of product attributes, price differences and customers' views, which underlined market definition to that point. In so doing, the Notice endorses a more economic based approach towards the problem of how to delineate antitrust markets.<sup>69</sup>

Following these advancements, the 1997 Notice on market definition has grown to serve – alongside the Commission's decisional practice – as the main source of guidance for the analyses of relevant markets.

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66 C. Bellamy and G. Child, *European Community Law of Competition*, Sweet and Maxwell (5<sup>th</sup> ed., 2001), at 395-397, 698. For example, in *Case 27/76 United Brands v. Commission*, (1978) ECR 207, the Court of Justice excluded France, Italy and the UK from the relevant geographic market, since despite presence of United Brands bananas, the conditions of trade in these states were said to be different. See also *Case 247/86, Alsatel v. Novasam*, (1988) ECR 5987, at para. 19.

67 For a general overview see T.E. Kauper, *The Problem of Market Definition Under EC Competition Law*, 20 *Fordham International Law Journal* 1682 (1997).

68 1997 Notice, at para. 1, 4, 5. For a general overview see I. Kokkoris, *The Concept of Market Definition and the SSNIP Test in the Merger Appraisal*, 26 *European Competition Law Review* 209 (2005).

69 B. Bishop, *Editorial: The Modernisation of DGIV*, 8 *European Competition Law Review* 481 (1997); Jones and Sufrin (2004), *op. cit.*, at 51.

Hereinafter, the basic principles governing the Commission's approach to market definition are addressed, together with the potential uses and misuses of the Notice. As the discussion portrays, the Notice leaves a great deal of room for Commission discretion when defining markets, which can be employed to achieve both economically sensible and insensible market definitions, depending on the methods employed.

### **3.3.2 The Commission's Notice on the Definition of the Relevant Market**

#### **3.3.2.1 A Preliminary Comment on the Legal Status of the Notice**

The European Commission occasionally issues guidelines, communications or notices, which are meant to clarify the Commission's approach regarding interpretation of a certain legal term, to reduce legal uncertainty and to structure the process of judicial review. These measures are often described as Community 'soft law', as opposed to 'hard law' that arises from treaties or regulations, expressing the fact that in general they have no legal effect. As a result, the 1997 Notice on the definition of the relevant market is in fact not legally binding, and cannot be treated as a legislative instrument.<sup>70</sup>

Although the European Commission is not a legislature, it can, by the weight of its decision-making and active practice make *de facto* law, which will have a considerable effect on business behaviour. The 1997 Notice viewed through this lens may lack the force of law, but it constitutes the relevant source for market definition queries, and the state of the art thinking of the Commission on this issue. It therefore follows that the more the Notice is used and reinforced by the European Commission and courts, the stronger its position in legal practice will be.

#### **3.3.2.2 Principles of Market Definition – The Notice's Theoretical Framework**

The 1997 Notice was promulgated with the aim of clarifying how the Commission applies the concept of the relevant market in its ongoing enforcement of Community competition law. Accordingly, it commences by highlighting the significance of market definition as an intermediary tool, its main purpose

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70 Institute of European Media Law e.V. (EMR), Media Market Definitions – Comparative Legal Analysis, Final Report (July/October 2003), Chapter 1 EC. Available at: [http://ec.europa.eu/comm/competition/publications/studies/media/chapter\\_1\\_ec.pdf](http://ec.europa.eu/comm/competition/publications/studies/media/chapter_1_ec.pdf), at 7; OECD, Competition Law and Policy in the European Union (2005). Available at: <http://www.oecd.org/dataoecd/7/41/35908641.pdf>, at 16. See also V. Korah, An Introductory Guide to EC Competition Law and Practice, Hart (8th ed., 2004), maintaining at 99: "The notice does not bind the courts and has not yet been applied by the ECJ or CFI. So the older case law is also relevant".

to establish the framework within which competition policy is applied by the Commission, and to systematically identify the competitive constraints faced by the undertakings involved. As such, market definition allows the calculation of market shares, which will convey meaningful information concerning market power, relevant for the application of Articles 81 and 82 EC.<sup>71</sup>

Unlike the U.S. Merger Guidelines, the Notice does not limit its spectrum of applicability to merger inquiries, and aims in general at all competition law issues requiring a definition of the relevant market, including mergers, abuse of dominance or Article 81 issues. The market definition methodology laid out in the Notice generally continues the line of the Commission's past decision-making practice, and follows the general dichotomy outlined by the U.S. Merger Guidelines by carrying out the analysis along the three main sources of competitive constraints affecting firms' conduct: demand substitution, supply substitution and potential competition, and along the product market and geographic market dimensions.

The product market dimension comprises:<sup>72</sup>

“all the products and services which are regarded as interchangeable or substitutable by the consumer, by reason of the products' characteristics, their price and their intended use”.

For example, if the pricing of grapefruit juice provides an effective competitive constraint on the pricing of orange juice (i.e. since they are both made from fruit and are deemed healthy by consumers), the two products will be included in the same relevant market.

The geographic market dimension considers:<sup>73</sup>

“the area in which the undertakings concerned are involved in the supply and demand of products or services, in which the conditions of competition are sufficiently homogenous and which can be distinguished from neighbouring areas because the conditions of competition are appreciably different in those area”.

The relevant geographic market is therefore defined with reference to the homogeneity of competitive conditions across regions, meaning for example that

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71 1997 Notice, at para. 2.

72 *Id.*, at para. 7.

73 *Id.*, at para. 8.

Italian mineral water could be considered in the same market as Swiss mineral water, as long as both are subject to the same taxes, thereby posing a significant competitive constraint on one another.

In order to assemble the relevant combination of products and regions, which effectively constrain the conduct of the firm under investigation, the Notice introduces the U.S.-based SSNIP test (or the *hypothetical monopolist* test) into the analysis of relevant markets.<sup>74</sup> The test seeks to sort out significant substitutes from insignificant ones, among the range of all possible substitutes considered by the consumer. This is done by postulating a small hypothetical and lasting change in the relative price of the product in question, in the range of 5% to 10%, and evaluating the likely reactions of customers to that increase.<sup>75</sup>

To recall the making of this process in practice consider, for example, an investigation into the conduct of an Italian mineral water producer. To define the relevant market in this case, the analysis has to consider first the type of product that the undertaking involved sells (the brand of mineral water) and the area in which it sells it (Italy, or a specific part of it). Assuming now that the Italian producer raises the price of its brand permanently by 5% above the current level, the question to be answered is whether customers would respond by switching into readily available substitutes or to suppliers located elsewhere. If consumers are in a position to shift their purchases to alternative products or areas (e.g. other mineral water brands, or other soft drinks) to a degree sufficient to make the price increase unprofitable (as a result of the loss of sales), the currently considered collection of products would not constitute a candidate market for competition law purposes, and additional substitutes and areas would have to be included in the contemplated market definition.

Clearly, the SSNIP test is concerned with the response of marginal consumers, not the average or typical consumer.<sup>76</sup> It is obvious that some consumers would never forsake the product following a price increase, but these consumers are not the focus of the test. The test merely examines whether a sufficiently large number of marginal consumers exists to be able to defeat any attempt of a firm to increase

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74 For a technical representation of the test see I.M. Dobbs, *Defining Markets for Ex Ante Regulation using the Hypothetical Monopolist Test*, 13 *International Journal of the Economics of Business* 83 (2006).

75 1997 Notice, at para. 15-18. It is common to suppose that the hypothetical price rise is maintained for one year. See P. Geroski and R. Griffith, *Identifying Anti-Trust Markets*, Institute for Fiscal Studies, Working Paper 03/01 (2003), at 9.

76 Veljanovski (2003), *op. cit.* at Part V, A (“in determining product substitutability it is the reaction of the marginal customers that counts”).

prices.<sup>77</sup> This process of adding the next-best substitute and enlarging the hypothetical monopolist's group of products must continue until the smallest set of products and geographic areas is formed, such that a small, permanent increase in the relative price would not induce any considerable substitution, and would thus be profitable.

The exercise of market definition addressed in this manner focuses on prices, and especially on demand substitution arising as a response to a hypothetical price increase. Generally speaking and in particular with respect to mergers, the baseline for this price increase is taken to be the prevailing price, although the Notice accounts for the inadequacy of that yardstick in certain circumstances.<sup>78</sup>

Though considering demand substitution to be the most immediate and disciplinary force on suppliers of a given product, the Notice also takes the possibility of supply substitution into account, when equally immediate and effective.<sup>79</sup> Supply substitution may be incorporated in the definition of the relevant market if suppliers not currently producing the relevant product are able to switch to producing and marketing that product in response to a small and permanent price increase, without incurring significant costs and risks. The additional production that is put on the market is likely to have a disciplinary effect on the competitive behaviour of the companies involved, and is assumed to render a price increase by the current producers unprofitable. Such supply-side responses typically arise when companies produce a different quality or grade of a certain product, and can thus expand their line of production to offer a wider range of products from various qualities when the need emerges.

Nevertheless, the Commission considers supply responses only to the extent that alternative suppliers are able to switch their production facilities and market the relevant product in the short term. Only when suppliers can react instantly to provide an available alternative to consumers, can supply substitution effectively restrain the pricing behaviour of the firms under investigation. In

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77 For example, even if 80% of the average adult's cereal consumption is of 'Adult' cereals, and 70% of the average child's consumption is of 'Kid' cereals, still there could be a sufficient number of people at the margin switching between Adult and Kid cereals in the event of an Adult cereal price increase. See D.L. Rubinfeld, *Market Definition with Differentiated Products: The Post/Nabisco Cereal Merger*, 68 *Antitrust Law Journal* 163, 168 (2000).

78 1997 Notice, at para. 19. The problem of measuring the hypothetical price increase against the prevailing price baseline arises typically in Article 82 cases (abuse of dominant position) and is further addressed below.

79 *Id.*, at para. 20-23.

such cases, the relevant product market will encompass all products and regions that are substitutable in demand and supply.<sup>80</sup>

The Notice's approach to supply-side substitution is exemplified with reference to paper. Paper is usually produced in a variety of different qualities, from standard writing paper to high-quality paper used to publish art books. Although for a given final customer the different qualities are not substitutable, since, for example, an art book cannot be printed on a low quality paper, paper producers are capable of producing a range of different qualities, and production can be fairly adjusted with negligible costs within a short time frame. Paper manufacturers are thus potentially able to compete for the provision of paper in various qualities, in order to defeat price increases of competing paper suppliers. In such circumstances, the Commission will not define a separate market for each type of paper and its respective use, but will instead include the various qualities in the relevant market.<sup>81</sup>

In contrast, when substitution would require suppliers to modify production, to significantly adjust existing assets, to make additional investments and strategic decisions, or to incur time delays, such supply responses will not be considered at the stage of market definition.<sup>82</sup> This is, for example, the case of branded beverages. Although bottling plants have in principal the ability to bottle different beverages, the associated time and costs involved in terms of advertising efforts, testing or distributing, prevents the inclusion of alternative suppliers in the relevant market. In these cases, the effect of supply side substitutability would be excluded from the market definition phase, and would be examined at a subsequent stage of the analysis dealing with potential competition and entry.<sup>83</sup>

The explicit integration of the hypothetical monopolist test in the market definition exercise was thought to signify a shift in the Commission's practice, towards a more coherent and accurate approach that should contribute to producing useful, predictable and economically sustainable antitrust markets.<sup>84</sup> The

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80 As previously noted, this approach differs from the one taken in the U.S., where market definition is based upon demand substitutability only. The UK Office of Fair Trading in its promulgated 2004 Guidelines on Market Definition followed a policy similar to the Notice's. Compare, however, with Werden (1993), *op. cit.*, at 524-527, discussing the advantages of separating supply-side considerations from the market definition. See also B. Durand, Office of the Chief Economist, DG-Competition, Market Definition: The Current View from the EU, Presented in CRAI Annual London Antitrust Seminar, London (June 29, 2006) (pointing out to problems associated with the assessment of supply substitutes).

81 1997 Notice, at para. 22.

82 *Id.*, at para. 23.

83 *Id.*, at para. 24.

84 Bishop (1997), *op. cit.*; CRA International, The Modernization of DGIV, competition memo (June 1997); S. Baker and L. Wu, Applying the Market Definition Guidelines of the European Commission, 19 European Competition Law Review 273 (1998); P. Crocioni, The Hypothetical Monopolist Test:

‘globalisation’ of the SSNIP test and the framework advanced by the Notice have furthermore been adopted by competition authorities in and outside Europe, reinforcing its position as the leading analytical framework for market definition.<sup>85</sup>

The triumph of the SSNIP test is not incidental since the question posed goes to the very core of why market definitions are so important. A 80% share of a market is likely to give a firm market power only if that market, as defined, has some economic significance, namely whether the market indeed provides limitations to the conduct of the firms included in it; whether it accounts for all meaningful substitutes, while leaving out weak ones. Most critically, compared to quantitative techniques used in the past to assess substitutability, the SSNIP test focuses on the own-price elasticity of demand for the entire market, namely on the overall substitution between a candidate market and substitutes outside this market, rather than on particular cross-price elasticities that treat only a pair of individual substitutes at the time. Defining the relevant market in this way ensures that all products and geographic areas, which impose a considerable competitive constraint on the products under investigation, are considered simultaneously. A hypothetical 5% price increase by the hypothetical monopolist can be profitable only if the volume of sales lost due to such an increase is outweighed by the profits gained, indicating that no significant substitutes exist for the product in question. In contrast, an unprofitable SSNIP reveals that strong competitors are still present to such an extent that the provisional definition would have to be expanded.

Additional steps towards a sound economic-based approach have been introduced by the Notice’s account of the evidence that may be used in the process of market delineation.<sup>86</sup> The Notice does not relinquish traditional considerations such as product characteristics or intended use from the market delineation exercise. Those are in fact considered to be the first step, arguably allowing the Commission to focus the field of investigation to the possible substitutes for the product in question. This approach remains in conformity with the Commission and the

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What It Can and Cannot Tell You, 23 *European Competition Law Review* 354 (2002). See also K.S. Desai, *Limitations on the Use of Economic Analysis in E.C. Competition Law Proceedings: Part I*, 23 *European Competition Law Review* 524 (2002), maintaining at 524 that “it was not until the adoption of the Market Definition Notice that it could be said that the European Commission sought to rely upon and be guided by economic arguments in defining markets, and encouraged companies and their advisers to adopt economic considerations in their submissions to the Commission”.

85 See, for example, United Kingdom Office of Fair Trading, *Market Definition, Competition Law Guidelines* (December 2004). A comprehensive list of countries which adopted the hypothetical monopolist test is presented in Bishop and Walker (2002), *op. cit.*, at 88.

86 P.D. Camesasca and R.J. Van den Bergh, *Achilles Uncovered: Revisiting the European Commission’s 1997 Market Definition*, 47 *Antitrust Bulletin* 143 (2002), at 164-170.

Court of Justice's practice in cases preceding the publication of the Notice.<sup>87</sup> Nonetheless, the Notice holds that functional interchangeability or similarity in characteristics does not provide, in and of itself, sufficient criteria to assess the responsiveness of consumers to relative price changes.<sup>88</sup>

Furthermore, the Notice categorises additional relevant factors to assess the degree of substitution and the intensity of competition between products and regions. Regarding the analysis of the product market dimension, those include probative evidence of substitution in the recent past (e.g. sudden events or shocks indicating substitution, changes in relative prices or launches of new products, and the observed market reactions to these changes in terms of quantities demanded), views of customers and competitors, consumers' preferences, barriers and costs associated with switching demand to potential substitutes, different categories of customers and price discrimination.<sup>89</sup> The analysis of the geographic scope of the market generally utilises the same type of evidence, with additional attention for national factors (e.g. preferences, brands, language, etc') and current geographic patterns of purchase.<sup>90</sup>

Most significantly, the Notice recognises that a market definition question viewed through the quantitative lens of the SSNIP can only sensibly be answered by using quantitative measures. It is the reliance on accurate economic instruments that will eventually establish whether the hypothetical monopolist methodology will actually find its way into antitrust practice. The real added value of the Notice's stipulations is therefore to be found in the registration of a number of quantitative tests suitable for the delineation of markets: estimates of price elasticities and cross-price elasticities of demand, similarity of price movements and price levels, and causality between price series.<sup>91</sup> With respect to geographic market definition, the Notice refers to the analysis of trade flows and shipment patterns.<sup>92</sup> The Notice acknowledges the potential contribution of quantitative tools, and considers it a relevant evidence to be regularly employed in its market identification exercises.<sup>93</sup>

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87 E.g. Case 27/76 *United Brands v. Commission*, (1978) ECR 207; Case C-22/78 *Hugin v. Commission*, (1979) ECR 1869.

88 1997 Notice, at para. 36.

89 *Id.*, at para. 38, 40-43.

90 *Id.*, at para. 45-51.

91 *Id.*, at para. 39.

92 *Id.*, at para. 49. It should be noted that whilst the Notice states at para. 45 that the same quantitative techniques used for the product market definition might as well be used in the geographic market definition, it seems to refer mostly to the analysis of price trends. In listing the relevant evidence for geographic market definition the Notice does not refer to consumers' switching behaviour following the price increase, thereby neglecting to account for the important role of demand elasticities.

93 For a review of the Notice's economic provisions see K. Desai, *The European Commission's Draft Notice on Market Definition: A Brief Guide to the Economics*, 18 *European Competition Law Review* 473 (1997).



### 3.3.2.3 The Notice's Pitfalls

Notwithstanding the advancements initiated by the 1997 Notice, the triumph of the SSNIP test is not a complete one. The approach articulated by the Commission suffers from several inconsistencies, which carry the risk of distorting the analysis and weakening its quality. To begin with, the SSNIP test is, for no apparent economic rationale, applied throughout the Notice only to demand substitution, and neglected when discussing supply substitution.<sup>94</sup> To continue the Notice's line of reasoning when examining possible reactions of paper manufacturers, the Notice raises the question whether competing manufacturers could modify their production facilities, but ignores the more important question whether undertaking such action would be economically feasible and would actually occur in practice. Whilst it may very well be the case that producers of high-quality paper are also able to produce low-quality paper, they may nevertheless be reluctant to modify their production process for a variety of reasons (e.g. the existence of long-term contractual obligations, the need to preserve brand reputation). Moreover, shifting production to the lower quality market segment may simply be less profitable, implying that in reality producers would refrain from implementing such change. There is thus no economically justified ground for excluding the SSNIP methodology from this part of the analysis.<sup>95</sup>

Furthermore, according to the Notice, the analysis of potential competition (i.e. any potential supply response surpassing the short-run) will not be carried at the stage of market definition. Any medium to long-term adjustments of competing suppliers are hence excluded from the market definition exercise, and are only taken into account at a subsequent stage, when assessing entry conditions. While it may be easier to appraise the factors and circumstances affecting entry into the market once the position of the companies involved in the relevant market has already been ascertained, omitting such considerations from the market definition carries the risk of generating overly narrow markets.<sup>96</sup> It should be recognised that a firm contemplating a price increase anticipates not only immediate reactions by current market rivals, but also strategic decisions or additional investments made by new entrants in the foreseeable future, which may render any price increase unprofitable. Moreover, in some markets (e.g. pharmaceuticals) potential rivals do pose effective competition, due to the prospect of their entry into the industry. Ignoring such considerations is likely to understate the magnitude of competitive constraints faced by market participants, and correspondingly overstate the degree of their market power.

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94 Camesasca and Van den Bergh (2002), *op. cit.*, at 159-161.

95 Van den Bergh and Camesasca (2006), *op. cit.*, at 128.

96 *Id.*, at 129.

Equally problematic is the Notice's persistence on traditional legal provisions alongside the integration of new quantitative measurement techniques, a combination that tends to obscure the analysis and diminishes the certainty regarding the results of the market definitions produced by the Commission.<sup>97</sup> Despite the seemingly well-structured and economic-based approach that the Notice attempts to convey, functional interchangeability considerations are intertwined in the Notice's textual layout,<sup>98</sup> and apparently still form a considerable part of the Commission's practice.<sup>99</sup> Particularly, the scope of the product dimension is discussed with a preliminary reference to product characteristics and intended use,<sup>100</sup> whilst the geographic dimension draws from the distribution of market shares of the parties and their competitors as well as an analysis of pricing and price differences at national and EU or EEA level.<sup>101</sup> However, using such an initial hypothesis divorces the exercise of market definition from the identification of market power, its ultimate objective.

To illustrate, consider whether cinema movies and DVD movies belong to the same relevant market. While the two products differ in their physical characteristics, form of distribution and price, DVD shops may effectively restrain cinema owners' attempts to exercise their market power and increase entry fees. Recognising that products with different characteristics may form one relevant market, a more economic approach requires a careful examination of consumers' migration between often seemingly distinct products on the event of a price increase. The Notice's first-step screening mechanism based on product characteristics and intended use may thus already at a preliminary stage of the investigation lead to an exclusion of relevant competitive forces.<sup>102</sup>

Finally, the introduction of economic techniques aimed at providing a more accurate measurement of substitution is as yet unsatisfactory. Although the SSNIP test was adopted as the central conceptual framework of the Notice, the

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97 Camesasca and Van den Bergh (2002), *op. cit.*, at 158-159.

98 Most notably, in para. 7, 8, 28 and 36 of the 1997 Notice.

99 L. Coppi and M. Walker, *Substantial Convergence or Parallel Paths? Similarities and Differences in the Economic Analysis of Horizontal Mergers in U.S. and EU Competition Law*, 49 *Antitrust Bulletin* 101, 104 (2004).

100 1997 Notice, at para 36: "An analysis of the product characteristics and its intended use allows the Commission, **as a first step, to limit the field of investigation** of possible substitutes" (emphasis added).

101 *Id.*, at para. 28: "[The Commission] will take a **preliminary view** of the scope of the geographic market on the basis of broad indications as to the distribution of market shares between the parties and their competitors, as well as a preliminary analysis of pricing and price differences at national and Community or EEA level. **This initial view is used basically as a working hypothesis** to focus the Commission's enquiries for the purposes of arriving at a precise geographic market definition" (emphasis added).

102 The opposite may also be true. Branded and unbranded paper towels may be erroneously placed in the same relevant market due to similarity in physical attributes and uses, whereas consumers may perceive these products as utterly distinct.

range of techniques that are introduced to quantify its impact is limited, and the techniques themselves are considered rather rudimentary in contemporary economic practice.<sup>103</sup> Moreover, the Notice's treatment of the geographic market differs from that of the relevant product market, both in the evidentiary materials listed and the registration of quantitative measures. Consequently, the Notice's framework may imply that the relevant product and geographic markets will be defined sequentially (as is often done in practice), rather than simultaneously.<sup>104</sup>

At the same time, the selection of quantitative techniques suggested by the Notice is incomplete, as more advanced economic insights are not yet endorsed.<sup>105</sup> In this respect, the Notice may signal, on the surface, a step forward from conventional legal methods, but in reality, suspicion towards the use of economic analysis is still highly evident. This stands in a sharp contrast to American antitrust authorities and courts, which exhibit an increasing openness towards the use of quantitative tools in the application of the SSNIP test, and are willing to consider economic analysis as persuasive and most influential evidence in a case.<sup>106</sup> These issues will be addressed at length in the following two chapters of this book.

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103 Coppi and Walker (2004), *op. cit.*, at 108-109.

104 D. Neven, R. Nuttal and P. Seabright, *Merger in Daylight: The Economics and Politics of European Merger Control*, Centre for Economic Policy Research (1993), at 54 "... unless by sheer coincidence the customers who would have substituted away towards other products were exactly the same as those who would have substituted away towards other locations, the total demand substitution towards both other products and other locations will exceed that in either dimension separately". Namely, since a price increase induces consumers to switch to different products and different regions at the same time, separating the analyses of the product and the geographic market would lead to too narrow market definitions. Van den Bergh and Camesasca (2006), *op. cit.*, at 129 echo this concern.

105 A large variety of quantitative tools may assist competition law litigations. For a general overview see D.L. Rubinfeld, *Symposium on Law and Economics: Econometrics in the Courtroom*, 85 *Columbia Law Review* 1048 (1985); A.M. Rosenfield, *The Use of Economic Analysis in Antitrust Litigation and Counseling*, 1986 *Columbia Business Law Review* 49 (1986); J. B. Baker and T.F. Bresnahan, *Empirical methods of Identifying and Measuring Market Power*, 61 *Antitrust Law Journal* 3 (1992); J.B Baker and D.L. Rubinfeld, *Empirical Methods in Antitrust Litigation: Review and Critique*, 1 *American Law and Economics Review* 386 (1999); LECG, *Quantitative Techniques in Competition Analysis*, Report prepared for the Office of Fair Trading, Research Paper No. 17 (1999); D. Scheffman and M. Coleman, *FTC Perspectives on the Use of Econometric Analyses in Antitrust Cases*. Available at: <http://www.ftc.gov/be/ftcperspectivesoneconometrics.pdf>; CRA International (published originally by Lexecon Ltd.), *An Introduction to Quantitative Techniques in Competition Analysis* (2003); D. Scheffman, *Sources of Information and Evidence in Merger Investigations: An FTC Economist's View*, Remarks to a session on "The Use of Economics in EC Competition Law", Brussels, Belgium (January 2003); C.Dippon, G. Leonard and L. Wu, *NERA Economic Consulting, Application of Empirical Methods in Merger Analysis* (June 27, 2005).

106 E.g. *Federal Trade Commission v. Staples, Inc.*, 970 F. Supp. 1066 (D.D.C. 1997), *FTC v. Tenet Healthcare Corp.*, 17 F. Supp. 2d 937 (E.D. Missouri, July 30, 1998), *FTC v. Tenet Healthcare Corp.*, 186 F.3d 1045 (8<sup>th</sup> Circuit 1999); *U.S. v. SunGard Data Systems, Inc.*, 172 F. Supp. 2d 172 (2001).

### 3.3.3 Potential Difficulties in the Application of the SSNIP Test

#### 3.3.3.1 The Application of the SSNIP Test to Monopolisation Cases: The Cellophane Fallacy

A wide range of antitrust cases involve an inquiry into the conduct of an outright monopoly or a dominant firm, and the allegation of abusing such market position and attempting to monopolise the market. Typical anti-competitive practices which carry potential power to exclude competitors from the market altogether include, among others, price discrimination, tying, refusal to deal, exclusive dealing, or predatory pricing.

The application of the SSNIP test in the context of monopoly or dominance investigations raises a number of serious concerns, stemming from the fundamental difference between the nature of analysis undertaken in dominance as opposed to merger cases. In merger investigations, the competitive concern is that a concentration will significantly impede effective competition as a result of the creation or strengthening of a dominant position,<sup>107</sup> and will therefore result in an increase in price, above the *prevailing price level*. The 1997 Notice on market definition follows the U.S. Merger Guidelines in reinforcing that the analysis in merger cases will be based upon the prevailing market price.<sup>108</sup> To that extent, merger investigations are forward-looking, as they are mostly concerned with the competitive environment subsequent to the merger, compared with the existing competitive constraints, namely at current prices. The SSNIP methodology to market definition therefore provides an appropriate framework within which anti-competitive mergers can be recognised and evaluated.

The situation differs, however, when assessing dominance claims. Unlike the progressive perspective taken in mergers, monopolisation cases focus on the current competitiveness of the market in question, and revolve around whether the firm under scrutiny can act, at present, independently of its competitors. The analysis thereby seeks to establish whether the dominant firm already possesses a considerable degree of market power, namely has the power to price its product in excess of the competitive price level, and not whether the firm can increase prices even further. Carrying out the SSNIP test becomes problematic under these circumstances (i.e. in relation to non-merger inquiries), since evidence of substitution at prevailing prices observed from the industry under investigation, upon which the implementation of the test necessarily relies, does not provide an appropriate yardstick against which the hypothetical price increase could be assessed.

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107 EC Horizontal Merger Guidelines, at para. 1.

108 1997 Notice, at para. 19; U.S. Merger Guidelines, at §2.2.

In particular, economic theory essentially presupposes that firms' seek to maximise their profits. Profit maximisation dictates that firms would always set prices at a level where further price increases are no longer profitable. Since the significance of the competitive constraints and the degree of substitution between products are directly linked to the current relative price level of products in the market – which implies that substitution may exist in one price level, but not necessarily if prices were lower – it may well be the case that the monopolist will set prices so high, such that even inferior substitutes will appear attractive to consumers. Hence, it makes no sense to establish whether a firm is a monopoly by asking if it could profitably increase price some more.

Competition analysis commonly refers to this problem as the *Cellophane fallacy*,<sup>109</sup> after the notorious decision of the U.S. Supreme Court in the case of *Du Pont*.<sup>110</sup> In *Du Pont*, evidence of substitution between cellophane and other packaging materials such as wax paper and aluminium foil, led the court to believe that cellophane belonged to a larger market of flexible packing materials, and did not constitute a separate relevant market on its own. As repeatedly noted by many commentators, the court failed to recognise that *Du Pont*, being the exclusive producer of cellophane, had already set prices so high that alternative products were able to provide an effective competitive constraint. The high level of cross-price elasticity, indicating vigorous substitution with other wrapping supplies, which was detected at the current price, implied, in effect, that *Du Pont* was exercising its market power to a full extent and not that the market was broader than just cellophane. There is now a consensus that the court erred in that regard, mistaking competition created by the exercise of market power for competition that can prevent the exercise of market power.<sup>111</sup>

To further illustrate the problem, consider the following hypothetical example. Suppose that there are two automobile manufacturers, one motorcycle manufacturer one bicycle manufacturer and one truck manufacturer operating in an isolated region. Bicycles sell for €50, motorcycles for €200, trucks for €1,500, and automobiles for €1,000. If the two automobile manufacturers decide to merge, data reveals that they could profitably raise the price to € 1,100. To

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109 For an overview see Bishop and Walker (2002), *op. cit.*, at 98-100.

110 *United States v. E. I. Du Pont de Nemours*, 351 U.S. 377 (1956).

111 P.E. Areeda, H. Hovenkamp and J.L. Solow, 2A *Antitrust Law*, Little (1995), at 208-209; H. Hovenkamp (2005), *op. cit.*, at 104-105; R.A. Posner and F.H. Easterbrook., *Antitrust: Cases, Economic Notes and other Materials*, West (2<sup>nd</sup> ed., 1981), at 360-362; L.A. Sullivan, *Handbook of the Law of Antitrust*, West (1977), at 53-58; G. J. Werden, *Demand Elasticities in Antitrust Analysis*, 66 *Antitrust Law Journal* 363, 377 (1998).

define the relevant market for the sake of this merger, a 5% price increase has to be presumed above the prevailing level. In this case, applying the SSNIP test would require that prices were raised to € 1050 (a 5% price increase above the current price). Since this price level is known to be profitable for the merged entity, the conclusion has to be that automobiles constitute a relevant market, and that the merger is likely to lessen competition in that market.

Assume now that only one automobile manufacturer exists, charging €1,100. To examine allegations concerning abuse of a dominant position, a relevant market would have to be defined, in order to assess the manufacturer's position in that market. Implementing the SSNIP test, the analysis has to consider whether the manufacturer could profitably raise its price to €1,155 (5% increase on €1,100). The problem in this case would be how to translate a negative answer to this question into a reliable antitrust market definition. Suppose data reveals that raising the price further to €1,155 will not be economically profitable, since consumers will switch to other modes of transportation. This might imply that automobiles on their own do not constitute a relevant antitrust market, and that the next-best substitutes, such as motorcycles, would have to be added into the definition. Adding additional products into the market diminishes each participant's market share, and as a result reduces the likelihood of finding the automobile manufacturer guilty of abuse. Concluding that the market is broader than just automobiles may, however, be wrong, since there is no information on whether €1100, which is the manufacturer's profit maximising price (following the economic understanding that every firm pursues profit maximisation), reflects effective competition between market participants, or a dominant position which allows the manufacturer to set prices independently, in excess of the competitive level. Misinterpreting these results will erroneously lead to overly broad market definitions, which do not reflect the genuine competitive constraints at hand.

This situation entails serious ramifications for the competitive assessment, since evidence of substitution between numerous products at the current price does not reveal much information regarding the exercise of market power by the firm, and cannot be interpreted to provide a decisive conclusion as to whether or not a firm already enjoys a dominant position in a narrower market.<sup>112</sup> Specifically, both a true monopolist and a firm that has no market power will be observed to face competition. High values of demand elasticities at current prices may indicate that the firm has no market power and is unable to raise prices above the

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112 NERA, *The Role of Market Definition in Monopoly and Dominance Inquiries*, Report prepared for the Office of Fair Trading, Economic Discussion Paper 2 (July 2001), at 15.

competitive level, but it may also indicate that the firm did have considerable market power at a lower price level, which allowed it to raise the price up to the level currently observed. At this level, an additional price increase might force consumers to treat alternative products as substitutes, since even a monopolist is constrained by competition of some sort.

Applying the SSNIP test to the prevailing price might therefore generate misleading conclusions, if the analysis fails to differentiate between circumstances in which the presence of competitors indicates the absence of market power, and circumstances where the presence of competitors is the consequence of exercising market power.<sup>113</sup> In other words, the identification of substitutes at existing prices does not necessarily reveal those products that are effective substitutes at the competitive price. However, it is the latter which constitutes the relevant benchmark for establishing market boundaries in monopolisation cases.<sup>114</sup>

The key implication of the cellophane fallacy is that the application of the standard market definition test in monopolisation inquiries is prone to arbitrariness, and will systematically tend to define overly broad markets. Moreover, since data regarding the competitive price level is not easily obtainable,<sup>115</sup> the practicality of the SSNIP test approach to market delineation is rendered limited, as it is difficult to assess a 5-10% deviation from the competitive price.<sup>116</sup>

This implies that in many Article 82 cases, market definition may not provide the correct framework to assess a firm's competitive stance.<sup>117</sup> The 1997 Notice acknowledges this potential pitfall, stating: "In particular for the investigation of abuses of dominant positions, the fact that the prevailing price might already have been substantially increased will be taken into account".<sup>118</sup>

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113 L.J. White, *Wanted: A Market Definition Paradigm for Monopolization Cases*, New York University, Center for Law and Business, Working Paper No. 99-002 (Spring 1999).

114 NERA (2001), *op. cit.*, at 17.

115 In fact, if one could identify the competitive price level then all Article 82 inquiries would become a trivial exercise of comparing observed prices with the competitive price in order to establish dominance.

116 To recall, the SSNIP test originated from the U.S. *Merger Guidelines*, which do not purport applying to allegations of monopolisation. However the merger jurisprudence, leading in the number of decisions as well as in their sophistication, has exercised a kind of gravitational influence, following which the test set by the 1997 Notice applies equally to merger as well as non-merger investigations. See CRA International, *The Modernization of DGIV*, Competition Memo (June 1997).

117 Baker and Wu (1998), *op. cit.*; F. Fishwick, *The Definition of the Relevant Market in the Competition Policy of the EEC*, 1 *Revue d'Economie Industrielle* 63 (1993); D. Geradin, P. Hofer, F. Louis, N. Petit and M. Walker, *The Concept of Dominance*, in GCLC Research Papers on Article 82 EC, Global Competition Law Centre, College of Europe, Bruges, Belgium (July 2005), at 13-14.

118 1997 Notice, at para. 19.

Nevertheless, nowhere is a solution offered, and the question how to address the problem in practice remains.

The lack of an appropriate theory has led to the question whether the SSNIP test should be abandoned in monopolisation cases.<sup>119</sup> Prominent scholars tend, nonetheless, to advocate against this proposition, holding that despite the legitimate concerns, the hypothetical monopolist methodology should not be modified or abandoned, and can still play a useful role in many monopolisation charges. A number of arguments have been forward to support this claim. First, even under Article 82, some of the issues arising present a question similar to that of mergers, depending on the nature of the alleged abuse, when asking whether a certain ongoing conduct would result in a creation of monopoly leading to an increase in price. Monopolisation inquiries typically allege that a firm's conduct has an exclusionary effect that, if left unchecked, would lead to a price increase (after rivals have been driven out or deterred from the market). In such cases, the relevant issue is whether the defendant can significantly raise the price above the current level after the exclusion is achieved, and the appropriate benchmark for implementing the test here remains the prevailing price level.<sup>120</sup>

On other occasions, despite evidence possibly tainted by the cellophane fallacy, it is feasible to conclude that the prevailing price exceeds the (competitive) benchmark price, by using alternative information deduced from "natural experiments". For instance, when a firm operates in multiple national markets, it is possible to provide evidence on price comparisons across regions in order to establish whether the firm is exercising market power in a localised area,<sup>121</sup> thus overcoming the need to rely solely on substitution at the current price, which may or may not reflect real competitive constraints.<sup>122</sup>

Finally, even if the problems arising as a result of the cellophane fallacy cannot be avoided altogether, the hypothetical monopolist test can still serve

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119 L.J. White, *Present at the Beginning of a New Era for Antitrust: Reflections on 1982-1983*, 16 *Review of Industrial Organization* 131 (2000), at 139-141

120 Werden G. J., *Market Delineation under the Merger Guidelines: Monopoly Cases and Alternative Approaches*, 16 *Review of Industrial Organization* 211 (2000), at 211-214; Bishop and Walker (2002), *op. cit.*, at 101-102.

121 For example, a finding that a firm systematically charges higher prices when controlling a large share of a regional market might serve to indicate that the firm has market power in this region. Such evidence was used in the Staples case (although in a context of a horizontal merger), to establish that a proposed merger between two office supply superstores (Staples and Office Depot) would greatly exacerbate seller concentration in metropolitan areas. See J.B. Baker, *Econometric Analysis in FTC v. Staples*, 18 *Journal of Public Policy & Marketing* 11 (1999).

122 Note, however, that inferring market power in this way diminishes the role for market definition since, economically speaking, there is no need to define the market and to calculate market shares in order to infer market power.



to structure a coherent discussion in relation to the relevant issues, and to distinguish between plausible and implausible market definitions.<sup>123</sup> For example, although evidence indicating substitution at current price does not prove that the products are in the same market, failing to show that substitution exists can rule out a proposed candidate market, and, at the very least, prove that the products are not in the same relevant market for the purpose of establishing dominance.<sup>124</sup>

### 3.3.3.2 Market Definition in High-Technology Markets.<sup>125</sup>

A growing number of antitrust cases involve what is generally known as ‘new economy’ markets, typically including computer hardware and software industries, pharmaceuticals, aerospace, biotechnology and communications. These are often characterised by a rapid pace of innovation, significant network effects and switching costs, increasing returns, globalisation of businesses and operation across multiple jurisdictions. The aggregate of these features has created many challenges for both courts and policy makers with respect to the proper application of competition provisions, to ensure efficient operation of these markets together with protecting and maintaining the conditions for its competitiveness.

Probably the most distinguished characteristic of innovation-based industries is the presence of significant demand side economies of scale, commonly referred to as network effects, implying that a service becomes more valuable as more people use it, thereby encouraging an ever-increasing number of adopters.<sup>126</sup>

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123 Bishop and Walker (2002), *op. cit.*, at 102-103.

124 NERA (2001), *op. cit.*, at 24-25.

125 This section closely follows Y. Ilan, *Competition Law and High-Tech Markets – Conventional Antitrust Thinking Revisited?* (2007). For a general overview on the application of antitrust law to high-technology markets see e.g. *Competition, Innovation and the Microsoft Monopoly: Antitrust in the Digital Marketplace*, Kluwer Academic Publishers (J.A. Eisenach and T.M. Leonard eds., 1999); D. Teece and M. Coleman, *The Meaning of Monopoly: Antitrust Analysis in High Technology Industries*, 43 *The Antitrust Bulletin* 826 (1998); D. Balto and R. Pitofsky, *Antitrust and High-Tech Industries: The New Challenge*, 43 *Antitrust Bulletin* 583 (1998); C. Pleatsikas and D. Teece, *The Analysis of Market Definition and Market Power in the Context of Rapid Innovation*, 19 *International Journal of Industrial Organization* 665 (2001); C. Pleatsikas and D. Teece, *New Indicia for Antitrust Analysis in Market experiencing Rapid Innovation*, In: *Dynamic Competition and Public Policy*, Cambridge University Press (J. Ellig ed., 2001), at 108; F. Fisher, *Innovative Industries and Antitrust: Comments on the Microsoft Antitrust Case*, 1 *Journal of Industry, Competition and Trade* 41 (2001); R.C. Lind, C. P. Muysert and M. Walker, *Innovation and Competition Policy*, Report prepared for the Office of Fair Trading, *Economic Discussion Paper* 3 (2002); P. Geroski, *Competition in Markets and Competition for Markets*, 3 *Journal of Industry, Competition and Trade* 151 (2003).

126 M. Katz and C. Shapiro, *Network Externalities, Competition and Compatibility*, 75 *American Economic Review* 424 (1985); J. Farrell & G. Saloner, *Standardization, Compatibility and Innovation*, 16 *Rand Journal of Economics* 70 (1985). Classic examples, considered as ‘direct’ network effects, are telephone or fax services. Additional (‘indirect’) network effects stem from the effect a large

The pronounced presence of network effect is thought to induce ‘tipping’, a process along which one network has taken a large portion of the market (due to the positive feedback of consumers), causing competing networks to gradually unravel, as consumers increasingly opt for the dominant network provider. Hence, network effects tend to induce exponential growth of a particular network on the expense of its rivals and produce market ‘leaders’, thus ‘tipping’ markets towards a single specific technological standard. Since the success of a network hinges on its rate of adoption among users, an already established standard will not be easily altered, as users find themselves captive and reluctant to incur the cost of switching.<sup>127</sup>

Consequently, such an environment fosters single-firm market dominance, while the fixation on an existing standard may present a significant barrier to entry to newcomers. As competition in these markets is fundamentally ‘for’ the entire market, rather than ‘in’ the market as is regularly assumed, the race to capture an early lead and maintain dominance once acquired may provide firms with strong incentives to employ anti-competitive strategies, as was exemplified by the recent *Microsoft*<sup>128</sup> litigation. However, such dominance, accompanied by high-market shares (and inherently translated into narrow market definitions by antitrust authorities) may be ephemeral, and be swiftly eroded by the next generation of technological advancements.

Due to the distinct nature of these competitive dynamics, it has become questionable whether traditional antitrust laws originally tailored to regulate firms’ conduct in conventional manufacturing and distribution industries, and adhering

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network has on complementary products. For example, the more individuals purchase the same computer operating system (OS), wider range of applications are written for that system, attracting in turn more users and generating positive feedback, and increasingly rendering the OS more lucrative to both programmers and end users.

- 127 M. Katz & C. Shapiro, Systems Competition and Network Effects, 8 *Journal of Economic Perspectives* 93 (1994), at 105-106. Network users often become committed to a certain product and cannot switch to alternatives without incurring significant costs. Such switching costs may include specific investments in equipment, uncertainty over the quality of the untested brand, loss of the departed network benefits, training, learning, searching and forgone loyalty programs. J. P. Choi, Irreversible Choice of Uncertain Technologies with Network Externalities, 25 *Rand Journal of Economics* 382 (1994); L.E. Lopatka and W.H. Page, Microsoft, Monopolization and Network Externalities: Some Uses and Abuses of Economic Theory in Antitrust Decision Making, 40 *Antitrust Bulletin* 317 (1995); J. Dratler, Microsoft as an Antitrust Target: IBM in Software?, 25 *Southwestern University Law Review* 671, 707 (1996); D. R Lee and R. B. McKenzie, Perspectives on the Intersection of Law, Technological Innovation and Consumer Protection: Perspectives on Antitrust Law: A Case for Letting a Firm Take Advantage of ‘Locked-In’ Customers, 52 *Hastings Law Journal* 795 (2001); J. Farrell and P. Klemperer, Coordination and Lock-In: Competition with Switching Costs and Network Effects, Working Paper Competition Policy Center 2006-W07 (2006), at 6.
- 128 Case COMP/C-3/37.792 *Microsoft* (Commission Decision of March 24, 2004); *United States v. Microsoft Corp.*, 253 F.3d 34 (D.C. Cir. 2001).

to a very static economic model, should also be applied to high technology, fast moving competition. Within this context, applying the market definition methodology outlined throughout this chapter becomes problematic, especially with the hypothetical monopolist concept governing the assessment.

A general complication is associated with the SSNIP test as the methodological instrument to define relevant markets in the new economy. The entire concept of the SSNIP test is rather static and focuses entirely upon short-term price competition within the existing competitive environment (i.e. given the existing price, technology and cost structure). As a result, antitrust agencies examine the effects of price changes on the demand for current generation products, and market participants are identified on the basis of their ability to adjust their supplies to price changes. In high-technology industries, however, this analytical framework might generate errors in market definitions. The traditional market definition exercise is designed to aid the identification of market power based upon the notion of pricing power (pricing in excess of marginal cost), but neglect an equally important account of exclusionary power, which might be far more prevalent in an innovative-driven environment.<sup>129</sup> In the markets in question, price almost always exceeds marginal cost (since the cost of producing an additional unit of a technological product is typically negligible), and the competitive level is hardly ever traceable. What matters is the firm's power to exclude, namely its ability to raise rivals' costs and reduce their ability to compete, or deter them from the market altogether. The harm to consumers under this dimension of market power does not materialise in the form of prices higher than competitive, but exists in the sense that consumers are deprived from potential innovations that could have raised their social welfare.

An additional shortcoming of the SSNIP test results from placing a large weight on short-term substitution in the demand side. In many dynamic contexts competition does not necessarily flow from readily available demand substitutes, but from new and improved products, whose time of introduction is most often uncertain.<sup>130</sup> In effect, the strongest competitive constraints on firms' conduct originate from firms not currently engaged in the marketplace. Moreover, the likelihood of supply responses by competing producers is also remote. In such highly specialised and segmented environment it seems very rare for a firm producing a certain product to respond to a competitor's price increase by modifying its performance

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129 Bishop and Walker (2002), *op. cit.*, at 73-74. Lind et al. (2002), *op. cit.*, at 48-51 exemplify two scenarios where errors could be made.

130 C. Ahlborn, D. Evans and J. Padilla, *Competition Policy in the New Economy: Is European Competition Law Up to the Challenge?* 22 *European Competition Law Review* 156, 161 (2001).

to another distinct product category within the short-run, due to enormous sunk costs and other barriers to entry. On the other hand, a much more significant threat is posed by potential competition from next-generation products, a threat which is maybe more timely but is clearly taken into consideration by innovative firms. Focusing attention on immediate demand and supply substitutes, would therefore likely fail to encompass all the significant sources of present and future competitive constraints affecting the behaviour of the firm in question.<sup>131</sup>

Further difficulty is posed by the 5% threshold used for detecting market power. High-technology industries are commonly extremely differentiated, with wide-ranging products offering multiple and sometimes converging or overlapping capabilities. Consumers may hence be much more oriented towards comparing products' functionalities rather than prices alone. Since competition on the basis of product attributes is very significant, markets defined only with relation to price considerations are likely to be unduly narrow, as a 5% price increase will probably not suffice to stimulate substitution. With technology rapidly advancing and new product lifecycle often few months in length, the price-performance relationship becomes the core interest of purchasers. There is a substantial problem, therefore, attempting to apply the SSNIP rule in a way that would capture the dynamic merits associated with this form of competition.<sup>132</sup>

There could be additional reasons why a 5% price increase will not truly reflect the magnitude of market power. Due to significant network effects along with prohibitive switching costs consumers are 'locked in' and tend to refrain from substitution on the occasion of a small price increase, even when alternative products are widely spread and offer compatibility or technological superiority. Thus, network externalities may narrow the scope of the relevant product market.

Moreover, a purported SSNIP is unlikely to yield meaningful results if an innovative firm deliberately refrains from exploiting its short-run pricing power, a common practice among technological leaders. High-technology firms often engage in very low pricing strategies (below marginal costs) aimed at winning absolute market control and reaping important first mover advantages. In some cases products are even given away for free, as part of a penetration

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131 Id.

132 Some scholars have contemplated a multi-attributed test, abbreviated as SSNIPP: Small but Significant and Non-transitory Increase in Price-Performance ratio. See for example R. Hartman, D. Teece, W. Mitchell and T. Jorde, *Assessing Market Power in Regimes of Rapid Technological Change*, 2 *Industrial and Corporate Change* 323 (1993); OECD, *Application of Competition Policy to High Tech Markets* (1997), at 10-11. Available at: <http://www.oecd.org/dataoecd/34/24/1920091.pdf>; Teece and Coleman (1998), *op. cit.*, at 853-857.

pricing strategy, taking account of the existence of significant network effects needed to establish an initial market foothold. Under these circumstances, applying a standard market definition exercise might produce misleadingly narrow markets, since with such low product prices, a 5% price increase will probably not be challenged by consumers.<sup>133</sup>

Finally, the SSNIP threshold must be applied with caution once multi-sided platforms are involved.<sup>134</sup> The latter are markets in which two groups of customers, who generate a positive feedback on one another, participate. To illustrate, payment cards are only valuable to cardholders if they can use the cards at an increasing number of stores. Respectively, payment cards are valuable to vendors if more customers possess these cards and use them for their purchases. The profitability of a SSNIP is hence contingent on the mutual feedback between the two sides of the market. Any price increase inflicted on payment cards will shrink cardholder volume, which in turn will reduce the demand of vendors for the system (which could then lead to a further decrease in cardholders' demand, and so on). As a result, a 5% price increase may appear profitable when one side of the market is viewed in isolation, but in order to assess overall profitability, a complete account of the effect on both sides must be made.<sup>135</sup>

Amid overlapping product functions and blurred market boundaries, these complications have led some commentators to dispute the usefulness of the existing market definition paradigm to dynamic markets. Others advocate a more lenient enforcement policy, one that would replace the predominant attention to market shares with a carefully tuned evaluation of industry conditions, specifically incorporating exclusionary conduct and potential competition. In that vein, market definition is thought to provide a good yardstick for underlying the most significant competitive constraints in a certain industry, but should not be enforced at all price, if other more direct means to evaluate the degree of market power are available.

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133 This phenomenon is commonly referred to as the *inverse cellophane fallacy*, as it generates overly narrow market definitions. See Lind et al. (2002), op. cit., at 55.

134 D. Evans, Defining Antitrust Markets when Firms Operate Two-Sided Platforms, 2005 Columbia Business Law Review 667 (2005); R.B. Hesse and J.H. Soven, Defining Relevant Product Market in Electronic Payment Network, 73 Antitrust Law Journal 709 (2006); R.B. Hesse, Two-Sided Platform Market and the Application of the Traditional Antitrust Analytical Framework, 3 Competition Policy International 191 (2007), at 192-193; D. Evans and R. Schmalensee, The Industrial Organization of Market with Two-Sided Platform, 3 Competition Policy International 151 (2007), at 173-175.

135 Notably, whilst both sides of the platform are interconnected, they are not necessarily equally priced. For example, Adobe, document production software, profitably sells the Acrobat Writer, whereas readers can enjoy the Acrobat Reader for free. Pricing and production decisions of the two sides are, however, inseparably intertwined.



## Chapter 4

# Quantitative Techniques

### 4.1 Introduction

The first chapters of this book have confirmed the central role of market definition in the competitive assessment. The definition of the relevant market is, however, often a difficult task, commonly fraught with controversies. Although contemporary competition law proclaims conformity with economic theory by integrating the economic-based SSNIP test as the prevailing methodology, the conclusion reached on market definition is not necessarily clear-cut, and unanimity as to market boundaries is rarely observed in most cases. Moreover, market delineation is very sensitive to the availability of data, the type of evidence presented (typically initiated by the parties), and more importantly, its interpretation.

Market definition inquiries are also very fact specific. For example, while in some industries branded products are significantly constrained by own-label products, in others the situation may be very different. Similarly, whereas the nature of supply for some products implies highly localised markets, for other supply of products may be cross-regional. Consequently, this exercise, which aims at identifying the closest set of substitutes, cannot easily be generalised, as it requires a thorough consideration of many economic factors relevant to the particular issue at hand.

Empirical techniques are granted a considerable role in this process. They provide an objective instrument to gauge the strength of competition between products, and reduce the inherent dependence on the parties' hypothesis or the need to rely on subjective judgments. Quantitative techniques have penetrated competition law analysis to a recognisable degree and some are routinely invoked by parties as well as by the Commission. However, it is clear that the choice of a technique to be used is derived not only from the data, but also from the analyst's economic background. Techniques which require more sophisticated economic capabilities are typically initiated by the economic experts involved in the case, but are evident to a much lesser degree in the Commission's own analysis. It is therefore not surprising that the most prevalent techniques,

e.g. price correlations, are those that combine modest economic expertise with little or no computational skills. This need not imply that some of the more straightforward techniques brought here do not convey meaningful information. Nonetheless, it can reasonably be assumed that the more advanced the economic tools that are utilised, the more robust the resulting market definition will be.

This chapter reviews the main quantitative tests applied in European competition analysis to this day, together with tests which are not frequently applied, but nonetheless offer potential contributions to the competitive assessment. Each technique is explained on its merits, its potential uses and misuses, and the ways in which it has been employed by competition authorities in the past. In many cases, it is the combination of techniques which can shed light on the market definition puzzle. The aim of this chapter is to provide a complete picture of the tools currently available for competition law practitioners, and to afford a better understanding of how and in what circumstances such tools may be used.

## **4.2 Shock Analysis**

The technique of shock analysis is based on natural experiments – observations of past events in a subject industry – from which one can draw inferences regarding the current form of competition in that industry.<sup>1</sup> The analysis looks at unanticipated shocks (i.e. changes) that occurred in the market, and considers whether the market response carries valuable information with respect to the underlying competitive constraints. Sudden historical changes to the supply or demand following such shocks, e.g. the entry of a newcomer, the launch of a new product, a strike, exchange rate volatility, regulatory intervention or technological improvement, can be a source of important insights into the current conditions of competition. Observations of market reaction to the change may therefore afford powerful inferences on the scope of the relevant product and geographic markets. Consider, for example, that a war caused a shortage in the supply of a product A and led to a price rise. Evidence on increased demand for product B may imply that consumers switched their purchase to B when A became scarcer, and can help to establish that the two products are close substitutes and thus belong to the same relevant market. Used in this manner, shock analysis can provide a simple and intuitive tool to test competing hypotheses in the analysis of market definition.

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<sup>1</sup> S. Bishop and M. Walker, *Economics of E.C. Competition Law: Concepts, Application and Measurement*, Sweet and Maxwell (2nd ed., 2002), at 323-324.



It is important to account, however, for possible complications in the application of this technique, mainly with respect to the causal relationship between the effect being identified and the source of the change. As with other techniques discussed below, it cannot automatically be assumed that a change in relative prices in an industry is attributed to entry which occurred at the same time, without examining the specific circumstances of the case, and excluding other potential factors that might have driven the change.

#### 4.2.1 Implementing Shock Analysis

Shock analysis technique was productive in numerous cases, two of which are examined below.

##### *Kimberly-Clark/Scott*<sup>2</sup>

The 1995 merger between Kimberley-Clark and Scott, leading suppliers of household tissue of various kinds, may illustrate how analysis of historical shocks can assist in corroborating an industry market definition. A primary issue in the investigation was the question whether the geographic reference market was European-wide, or confined to the UK and Ireland. In determining market boundaries, the Commission took notice of the departure of the Sterling from the EMS a few years earlier, a shock to the exchange rate mechanism in September 1992 that tended in general to depress UK prices, and allowed an opportunity to assess whether competitive pressures in a given industry or geographic area would push prices back to equality. If the market, as advocated by the parties, was indeed West European, supply from the UK would expand to the continent and vice versa, bringing prices back to relative uniformity.<sup>3</sup>

Nevertheless, an analysis of trans-national flow of tissue products (exports and imports) in 1994 (2 years after the shock) indicated that Irish imports and exports were almost entirely with the UK, whilst the most important destination of UK exports was Ireland.<sup>4</sup> This stood in contrast to Italy, for example, which exhibited a very high volume of exports. Moreover, a comprehensive comparison of tissue product prices across countries based on data submitted by the parties showed that UK and Irish prices of toilet products were remarkably higher than in continental Europe<sup>5</sup> (pursuant to the 1992 shock), which further indicated on the geographic separation of the UK, as under these circumstances, there was no evidence to suggest that household tissue market boundaries were larger.

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2 Case IV/M.623 Kimberly-Clark/Scott, (1996) OJ L 183/1.

3 CRA International (published originally by Lexecon Ltd.), *An Introduction to Quantitative Techniques in Competition Analysis* (2003), at 35.

4 Case IV/M.623 Kimberly-Clark/Scott, (1996) OJ L 183/1, at para. 67.

5 Id., at para. 72-80.

***Procter & Gamble/VP Schickedanz***<sup>6</sup>

Shock analysis does not necessarily imply shocks external to the industry in question, but can also take the form of a previous interaction between the firms under investigation. Procter & Gamble/VP Schickedanz was a proposed merger between two major feminine hygiene products manufacturers, producing the leading brands of sanitary towels Always and Camelia, respectively. At issue was the question whether sanitary towels form a distinct market (in which the merging parties' market share would be substantial), or whether the market should be extended to comprise both sanitary towels and tampons. Among other evidence brought before the Commission with respect to substitution of sanitary towels with tampons, the investigation included observations of past interaction between these products. The evidence of a shock attributed to the launch of Always towels into the German market in July/August 1991 was of crucial importance in this case. If tampons and towels were in the same relevant market, similar price reactions for both types of products would be expected following the above introduction of Always. In order to establish the effect of the shock, the Commission examined what happened to prices in the towels and tampons sectors six months after and two and a half years after the entry of Always. As it appeared, the producers of towels responded to the new entrant by cutting prices. On the other hand, not only did the price of tampons not decrease, but was in fact increased. In the longer term, the price of tampons climbed significantly, whereas the price of towels increased to a much smaller degree. These results are best settled with tampons and towels being in distinct relevant markets.

This conclusion was further entrenched by the Commission's inquiry into the market shares of towels and tampons after the entry. Evidence showed that the proportion of women using tampons did not change considerably: Always took market share from other towels, but not from tampons. Such results reinforced the proposition that subsequent to the entry, and in the years that followed, Always competed with other towels, but not with tampons.

**4.3 Similarity of Price Level**

In economics, a market is said to be the area within which price is determined.<sup>7</sup> A given area is considered a market if the price of a good in that area tends to uniformity (allowance being made for transportation costs), and markets are defined according to the 'law of one price'. Economic markets therefore consist of an area

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6 Case IV/M.430 Procter & Gamble/VP Schickedanz, (1994) OJ L 354/32.

7 A. Marshall, 1 Principles of Economics, Macmillan (9th ed., 1961), at 325.

of relatively homogeneous demand, within which prices of products are linked to one another by supply-side and demand-side arbitrage.<sup>8</sup>

The reciprocal relationship between price determination and market determination suggests a central role for prices, as a primary indicator for market boundaries. Nevertheless, the notion of a market as a place where a single price holds does not always correspond to the concept of a relevant antitrust market, which places emphasis on the magnitude of competitive constraints between products and regions. Hence, a relevant antitrust market can match, be wider or narrower than an economic market.<sup>9</sup>

Consequently, relying on absolute differences in price levels between products in antitrust investigations may lead to a correct answer in some cases, but to a wrong answer in others. Most importantly, inferring that products with substantially different prices are not close substitutes overlooks the central question pertinent to competition law inquiries, which remains whether a relative increase in the price of one product will induce enough consumers to switch to another product, as to render the price increase unprofitable.

In particular, defining a relevant market based on observed price differences will be misleading if price differentials reflect actual or perceived quality differences. When products differ in quality, focusing solely on prices will fail to capture consumers' price-performance trade-off. Consumers may be willing to pay double the amount for a product which is perceived by them to be 'twice as good', or when the product is heavily branded. For instance, while branded whisky may cost twice the price of unbranded whisky (despite similar content of the bottles), and may appeal to an upper consumers' class, the question left unanswered is whether the lower-priced whisky can constrain a price increase of the higher-priced whisky. Such a question can only be answered empirically.<sup>10</sup>

Even in places where price differences reflect actual dissimilar functionalities or intended use of the products under investigation, this need not imply, from an antitrust perspective, that the products lie in separate relevant markets. The latter point may be illustrated using the Commission's market definition in

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8 G.J. Stigler and R.A. Sherwin, *The Extent of the Market*, 28 *Journal of Law & Economics* 555 (1985); D.T. Scheffman and P.T. Spiller, *Geographic Market Definition under the U.S. Department of Justice Merger Guidelines*, 30 *Journal of Law & Economics* 123, 125 (1987).

9 For further discussion see Chapter 3.

10 This was recognised for example in Case IV/M.623 *Kimberly-Clark/Scott*, (1996) OJ L 183/1, where the Commission concluded that branded and private label toilet tissues were in the same relevant market despite obvious price differences, on the basis of a quantitative analysis based on market studies which estimated the cross-price elasticities between the products.

*Volvo/Scania*,<sup>11</sup> a merger concerning heavy trucks that was eventually blocked. The Commission divided trucks into three separate markets: heavy-duty trucks (above 16 tonnes), medium-duty trucks (5-16 tonnes) and light-duty trucks (below 5 tonnes). Whereas the price of trucks in each market segment presumably differed,<sup>12</sup> the relevant point of interest should be consumers' reaction to a potential price increase. An inquiry into the merging firms' market power must therefore focus on the feasibility of substitution between the distinct trucks categories, asking for example, whether consumers could purchase a couple of medium-duty trucks to replace one heavy-duty truck, if the latter's price were to increase. The real question in these circumstances remains the degree to which the pricing of one product is constrained by the existence of a second product, a question which cannot be answered by comparing the products' prices alone.<sup>13</sup>

#### **4.3.1 Employing Price Differences in Competition Law Analysis**

Differences in absolute price levels served the European Commission in delineating product markets in several past and recent decisions. In the case of *Digital/Kienzle*,<sup>14</sup> price bands were used to categorise markets for computers, distinguishing computers priced up to \$100,000 from computers priced \$100,000 to \$1 million. In the same manner price differences were used to separate commuter transportation with 20 to 39 seats, 40 to 59 seats and 60 seats and over, in *Aerospatiale-Alenia/de Havilland*.<sup>15</sup> In *Nestlé/Perrier*,<sup>16</sup> the Commission pointed to an observed gap between retail prices of source water and other soft drinks as a main factor in its decision not to group them in one relevant market.

In *Mannesmann/Vallourec/Ilva*<sup>17</sup> the Commission distinguished the U.S. and Japan from Western Europe in considering the relevant geographic market for stainless steel tubes, since prices were on average 20% higher in Japan and 5% higher in the U.S than in Western Europe. In *Orkla/Volvo*,<sup>18</sup> the Commission considered pills beer as a separate market since per litre it was 40% more expensive than carbonated soft drinks, and 75% cheaper than wine. Finally, in *HP/Compaq*,<sup>19</sup> the Commission divided the market for computer servers according

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11 Case Comp/M.1672 Volvo/Scania, (2001) OJ L 143/74. See also the case discussion in M. Stenborg, Biases in the Market Definition Procedure, ETLA - The Research Institute of the Finnish Economy (2004), at 11. Available at: [http://www.etla.fi/files/1009\\_dp903.pdf](http://www.etla.fi/files/1009_dp903.pdf).

12 Note, however, that the Commission's product market segmentation in this case apparently relied on functional and technical consideration, and not on price differences.

13 Bishop and Walker (2002), op. cit., at 108-110.

14 Case IV/M.0057 Digital/Kienzle, (1991) OJ C 56.

15 Case IV/M.053 Aerospatiale-Alenia/de Havilland, (1991) OJ L 334/42.

16 Case IV/M.190 Nestlé/Perrier, (1992) OJ L 356/1.

17 Case IV/M.315 Mannesmann/Vallourec/Ilva, (1994) OJ L 102/15.

18 Case IV/M.582 Orkla/Volvo, (1996) OJ L 66/17.

19 Case COMP/M.2609 HP/Compaq, (2002) OJ C 39/23.

to price ranges (below \$100,000, between \$100,000 and \$999,999, and above \$1,000,000), and while reverting to its previous decisions, re-established that absolute price differences can provide a useful proxy for separating and delineating markets.

#### 4.4 Price Correlation Analysis

Correlation analysis is a statistical technique used to measure the degree of interdependence between any paired variables.<sup>20</sup> Price correlation analysis therefore conveys the degree of relationship between prices of two different products. The analysis follows a reasonably straightforward rationale: if two products are in the same relevant market, the price of each will effectively constrain the other. When the price of one product increases, the quantity demanded of the product is expected to decrease. On the demand side, consumers will switch to a substitute product with a relatively cheaper price. On the supply side, competing producers will shift production to the product with the higher relative price. The increased demand for the cheaper product is expected to lead to its price rising, while the excessive supply of the more expensive product is expected to lead to its price falling. It is generally believed that each movement in prices of substitute products will create a market reaction. As a result, if products were in the same market, one would expect their prices to move together over time.<sup>21</sup>

The implementation of the technique is based upon observed price series of the products in question over a certain period of time. The analysis further monitors the subject price movements, and provides a measure of the (statistical) relationship between them over the relevant period. Prices are said to be correlated if a change in the price of one product is associated with a change in the price of the other. The degree of association between the prices (the extent to which price series of two different products move together) is measured by a statistical parameter called *correlation coefficient*, a number that expresses quantitatively the scale of the relationship between the two price series.

By definition, the correlation coefficient can always lie between -1 and 1, where +1 implies a positive correlation (the price series move perfectly together), -1 implies negative correlation (the price series move perfectly inversely to one another), and zero implies that there is no statistical association between the two series.<sup>22</sup> In general, the higher the degree of correlation, the more likely it is that

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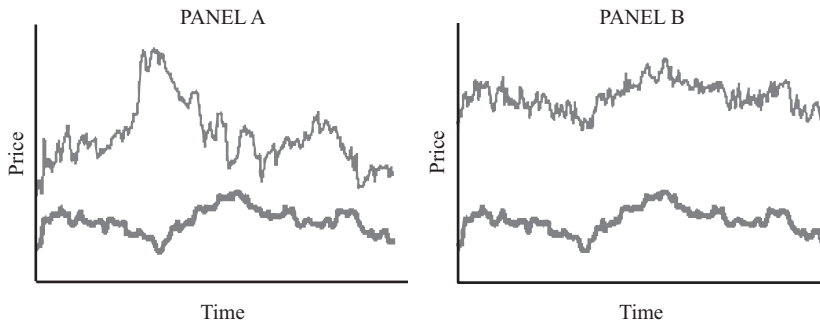
20 C. Spatz., *Basic Statistics*, Wadsworth (2001), at 580.

21 Bishop and Walker (2002), *op. cit.*, at 382.

22 *Id.*, at 383.

the products are closer substitutes, and belong to the same market.<sup>23</sup> The following charts illustrate the price correlation approach.<sup>24</sup>

**Figure 1.** Price Changes of Two Products over Time



Both panels graphically present price data of two different products, observed over a certain period of time. While in panel A the two price series seem to move independently of one another, the price series in panel B move closely together. This implies a high correlation coefficient between these products, which in turn signifies that the products are likely to be close substitutes.

#### 4.4.1 Shortcomings of Price Correlation Analysis

Despite its obvious appeal, it is precarious to conduct an assessment of the relevant market based solely on price correlations, if one wishes to define the market correctly. In fact, correlation analysis as a sole means for defining market is no longer considered a sufficiently robust tool, as the technique suffers from several inherent shortcomings that undermine its effectiveness and reliability. The main points of critique are elaborated in the following sections.

##### 4.4.1.1 Causality

Although correlation analysis may seem persuasive, especially when accompanied by a graphical representation of the data, it does not in fact allow any inferences to be made about the causal relationship between the two products under investigation. The fact that two price series generate a sizeable correlation

23 Note that high correlation does not indicate that the prices of the products under inquiry are similar in absolute terms, but only that their relative price remains constant. That is, a specified percentage change in the price of one product results in a consistent percentage change in the price of the other product.

24 CRA International (2003), op. cit., at 5.

coefficient does not automatically mean that these two products belong to the same relevant market.

As elaborated earlier, an antitrust market according to the 1997 Notice<sup>25</sup> encompasses a group of products for which a 5-10% price increase inflicted by the hypothetical monopolist of the group would be profitable. Bearing this definition in mind, clearly the fact that two products are highly correlated does not prove that they constitute one relevant market. Even when the correlation exhibits a real competitive interaction between the two products (assuming that the correlation is not spurious), it does not necessarily indicate that the degree of competition is sufficient to prevent a profitable increase in the price of one of them. A high correlation can only suggest that competitive interaction exists to a certain extent, but this alone is insufficient to establish that two products belong to the same market, and it does not exclude the possibility of one of the products being a relevant market by itself.<sup>26</sup>

#### 4.4.1.2 Supply Responses of Competing Firms

An additional complication to the interpretation of price correlation results may arise once failing to account for supply responses of competing firms. Reactions of competitors to any price increase by a product A depend on their elasticity of supply,<sup>27</sup> and might therefore carry perverse implications for correlation analysis.

For a given rise in the price of product A, a competing firm with a high elasticity of supply can expand production and increase its output, thereby meeting the excessive demand for product A and rendering its price increase unprofitable. Nonetheless, since the substitute product's price did not increase (but rather the quantity supplied increased), price correlation analysis might generate a low correlation, falling short of indicating that the producer of A is effectively constrained by its rival, and wrongly pointing to the existence of separate markets.

Conversely, if a competing firm faces a low elasticity of supply, it will refrain from increasing output, and is instead expected to follow product A and increase its own price respectively. In this case, although the substitute product

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25 Commission Notice on the Definition of the Relevant Market for the Purposes of Community Competition Law, OJ C 372/5 (1997) (hereinafter: "1997 Notice").

26 Bishop and Walker (2002), *op. cit.*, at 388-389. As recognised by the Commission in Case IV/M.315 Mannesmann/Vallourec/Ilva, (1994) OJ L 102/15, at para. 32: "while absence of price correlation between two geographical areas is a strong indicator of different geographical markets, the existence of price correlations does not necessarily indicate a single market in the absence of other elements".

27 The elasticity of supply is defined as the percentage change in quantity supplied from a product resulting from a one percent increase in its price. See R.S. Pindyck and D.L. Rubinfeld, *Microeconomics*, Prentice Hall (6<sup>th</sup> ed., 2005), at 35.

does not pose much of a competitive constraint on product A, the prices of the two products may appear highly correlated, and the conclusions drawn from the analysis misguided. This implies that any results of price correlation analysis should be considered in light of potential supply-side responses of competing firms, and accompanied by further analysis of specific market conditions.<sup>28</sup>

#### **4.4.1.3 Spurious Correlation**

A spurious correlation arises when the relationship between two price series is not driven by a competitive interaction, but caused by mutually shared factors that are not held constant in the analysis.<sup>29</sup> In such a case, the correlation analysis might falsely indicate that the two products compete with one another, while in reality the similar price trend can be explained by other reasons.

One prevalent source of spurious correlation is common costs and common influences. Two unrelated products or regions might display a high degree of correlation merely because they are produced by a shared input, even when no real competition exists between them.<sup>30</sup> Another cause for a distorted correlation analysis can be seasonality, where prices of two products display the same movement patterns, stemming not from a competitive dynamics but from their increased or decreased sales in different periods of the year, for example, ice cream and bathing suits, both sold independently of one another, but at similar times.<sup>31</sup> Inflation or exchange rates are additional potential sources of spurious correlation. Inflation causes all products in one country to be correlated to a certain degree, due to the impact of price rise on most of the products in the region. Exchange rates might distort the correlation if prior to conducting the analysis prices are not carefully converted into the same currency, taking into account the impact of exchange rate volatilities over time.<sup>32</sup>

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28 G.J. Werden and M. Froeb, *Correlation, Causality, and All That Jazz: The Inherent Shortcomings of Price Tests for Antitrust Delineation*, 8 *Review of Industrial Organization* 329 (1993); Bishop and Walker (2002), *op. cit.*, at 390.

29 D. Kaserman and H. Zeisel, *Market Definition: Implementing the Department of Justice Merger Guidelines*, 4 *Antitrust Bulletin* 665, 673 (1996); P. Massey, *Market Definition and Market Power in Competition Analysis: Some Practical Issues*, 31 *Economic and Social Review* 309, 315 (2000).

30 Petrol and toothbrushes are both produced using oil. As a result, their prices might move together, when obviously they do not form part of the same relevant market. See Bishop and Walker (2002), *op. cit.*, at 392. The influence of common trends can be purged by removing all the common variables from the analysis, or by using a regression analysis. See Stigler and Sherwin (1985), *op. cit.*, at 573; See also LECG, *Quantitative Techniques in Competition Analysis*, Prepared for the Office of Fair Trading Research Paper No. 17 (1999), at 55.

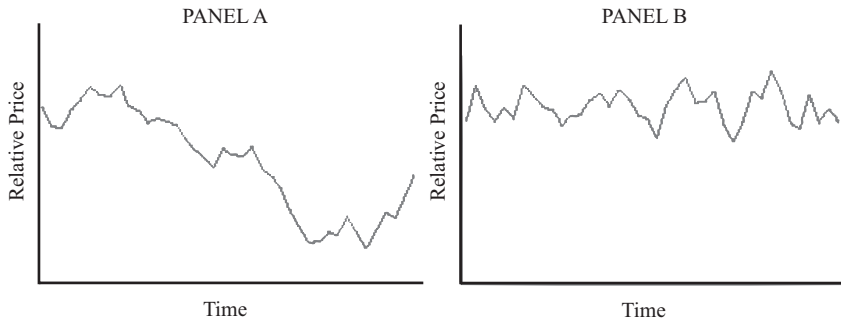
31 Lexecon Ltd., *Quantitative Techniques in Market Definition* (1999), at 14.

32 *Id.*; Bishop and Walker (2002), *op. cit.*, at 396-404 elaborate on the problem.



Some of the above mentioned complications might be alleviated by using ‘stationarity’ tests, which examine whether there is a tendency for the relative prices of the goods (the ratio of one price to another) to revert to a constant value after any temporary deviation, unique to the relevant market under investigation.<sup>33</sup> Stationarity analysis examines how relative (rather than absolute) prices of two products, or of one product in two different locations, perform over a period of time. Products being in the same relevant market (provided that market structure did not change radically) are assumed to revert to a long-term value, which is stable over time. Any drift away is rapidly corrected by market forces, thanks to the competitive constraints imposed by substitute products. The following chart illustrates how stationary price series differs from a non-stationary one.<sup>34</sup>

**Figure 2.** Stationary and Non-Stationary Price Series



Panel A depicts a non-stationary price series, since along the examined period there is no observed tendency to return to a constant value. In panel B, relative prices fluctuate, but are generally expected to return to the same level. Therefore, products or regions represented in panel B are assumed to be in the same relevant market.

Whilst this approach resembles price correlation analysis to a great deal, it enables overcoming some of the latter’s shortcomings. The results of stationarity analysis are not sensitive to common influences, since it focuses on relative prices, and not actual ones. As a result, common costs or common influences will not cause a bias in the market definition generated by prices moving in the same direction, since changes in price levels of two products will cancel each other out, and will leave the relative price of the product unaltered.

33 H. Wills, *Market Definition: How Stationarity Tests Can Improve Accuracy*, 23 *European Competition Law Review* 4 (2002); M. Forni, *Using Stationarity Tests in Antitrust Market Definition*, 6 *American Law and Economics Review* 441 (2004); CRA International (2003), *op. cit.*, at 9-10.

34 CRA International (2003), *op. cit.*, at 9.

#### 4.4.1.4 Delayed Response

A further problem with correlation analysis concerns the delay in response of some products or areas. Namely, if time intervals are not accounted for in the price correlation analysis, it might generate a misleadingly low correlation, when in fact the series are highly correlated but price adjustments would appear only in the longer run.<sup>35</sup> A possible solution here is visual inspection of the plotted price series.<sup>36</sup>

#### 4.4.1.5 Benchmarking

As a final observation, one may wonder how to translate the results of a correlation analysis into a decisive conclusion concerning the competitive situation of the products under investigation. Put simply, it is necessary to determine how high a correlation coefficient has to be for two products or regions, to form a relevant market. Is a correlation of 0.5 high enough, or is 0.9 needed?

Benchmarking techniques provide a partial response to this question. The main idea is to choose two products from the same industry that *a priori* belong to the same relevant market, and calculate the correlation between them. This correlation will serve as a benchmark against which other correlations will be compared. For example, consider the market for cola. First, Coca-Cola and Pepsi-Cola are chosen, assuming that there is a substantial competitive interaction between them, and their respective correlation is computed to be the benchmark. Second, other branded and non-branded cola is being correlated with either Pepsi or Coca-Cola. If the correlation is higher than the benchmark, the products are being included in the same relevant market. Note, however, that the use of benchmarking may also be problematic, since it includes *a priori* judgments which are not always straightforward. The assessment is sensitive to the choice of a benchmark, and might be compromised if the latter was selected arbitrarily.<sup>37</sup>

In conclusion, correlation analysis can provide a useful aid for market definition, yet it should be handled with care. While such analysis may infer the degree of competition between the products under investigation, a price correlation (even if significant) does not allow a cause-and-effect statement about market boundaries. The approach suffers from several valid criticisms, and taking the results of the analysis for granted without further investigation might lead to incorrect conclusions about market definition.<sup>38</sup> It is therefore advisable to treat

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35 Kaserman and Zeisel (1996), *op. cit.*, at 673.

36 LECG (1999), *op. cit.*, at 55.

37 Bishop and Walker (2002), *op. cit.*, at 394-396.

38 W.M. Landes and R.A. Posner, 94 *Harvard Law Review* 937, 964 (1981) consider, for example, the case of a domestic producer with a relative cost advantage for a product over foreign producers whose total production is substantial relative to its own. The domestic producer's best strategy is

correlation analysis with a certain degree of caution, preferably as one piece of evidence among others in a case.

#### 4.4.2 Employing Price Correlations in Competition Law Analysis

The first to suggest relying on similarity of price movements in defining the relevant market were Stigler and Sherwin in 1985.<sup>39</sup> Nowadays, the technique is widely used as a tool for market delineation in many EC competition law investigations and particularly in merger cases, probably due to its relative simplicity and modest data requirements. In *Nestlé/Perrier*<sup>40</sup> price correlation analysis played a central role in the market definition assessment taken by the Commission, regarding the proposed merger of the two manufacturers of bottled water. An important issue in this case was the strength of competitive constraints imposed by different types of mineral water (still and sparkling water), and between mineral water and other soft drinks, e.g. fruit juices. If still bottled water comprised a distinct market from sparkling bottled water, or if bottled water alone composed a distinguished relevant market, the merger would create a high degree of concentration, evidently raising antitrust concerns. Alternatively, if bottled water were only a segment of a broader market which included also other soft drinks, than clearly the merger posed lower risk for the competitive environment.

A comparison of manufacturers' list prices identified that prices of soft drinks exhibited a declining trend over the relevant period. In contrast, prices of mineral water were shown to evolve. Moreover, a price correlation analysis indicated that the correlation between different brands of mineral water was positive and high (ranged between 0.85 and 1). At the same time, while other soft drinks such as Coca-Cola, Tonic or Schweppes were highly and positively correlated among themselves, the correlation between each soft drink and bottled water was in most cases negative, or low when positive. In line with these findings, the Commission concluded that the soft drinks market and the mineral water market were subject to different competitive constraints, and were thus separated.

Another example for a case where price correlation tests were imperative in establishing market boundaries is *Rexam/ANC*,<sup>41</sup> a proposed merger between two beverage can manufacturers. The assessment of the relevant product market

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to keep his price level just below foreign producers' costs, to prevent the possibility of imports and keep them out entirely. Although the domestic and foreign productions may constitute distinct markets, price correlation analysis in this case might prove differently. See also S. Kimmel, Price Correlation and Market Definition, Economic Analysis Group Discussion Paper, U.S. Department of Justice, Antitrust Division (1987), at 4.

39 Stigler and Sherwin (1985), op. cit.

40 Case IV/M.190 Nestlé/Perrier, (1992) OJ L 356/1.

41 Case COMP/M.1939 Rexam/American National Can, (2001) OJ C 325/11.

involved the question whether aluminium and steel beverage cans were substitutable products. The investigation carried out by the Commission, applying correlation analysis, considered all countries where both types of cans were sold, and was performed also for aluminium cans and aluminium can sheet, as well as for steel cans and steel can sheet, in order to prevent spurious correlation due to common metal costs. The results of the analysis pointed to the existence of a high level of correlation between aluminium and steel beverage cans, ranging between 0.81 and 1 in 33cl beverage cans, and 0.83-0.99 in 50cc beverage cans. Such a result supported the conclusion that both aluminium and steel cans belonged to the same product market, since an overall price increase in aluminium cans would be defeated by the shift of customers to steel cans.

#### **4.5 Granger Causality Test and Cointegration Analysis**

Granger causality is an econometric technique that gained considerable success in recent years as an alternative to price correlation analysis. In the same manner as price correlation, Granger causality is employed to assess the direction and degree of interdependence between the investigated variables. However, whereas price correlation merely examines the degree of (contemporary) correlation between prices of two products regardless of its source, causality tests seek to establish whether there is causation from one series to the other, or whether the two series instantaneously cause each other.<sup>42</sup>

A variable X is said to Granger-cause a variable Y if taking into account past values of variable X leads to improvements in the predictions of variable Y. In other words, Y can be better predicted by using past values of X than by not doing so. This implies that predictions of the price of Y will be enhanced using available information on the prices of X and Y, rather than using information on the price of Y alone.<sup>43</sup>

Suppose, for example, that X and Y are two regions. If X and Y form one relevant geographic market, a change in the price of the product in region X will have spillover effects into region Y, and price data from both regions should indicate that the price in region X Granger-causes the price in region Y. If, in contrast, the regions are distinct and do not competitively constrain one another, there will be no arbitrage, and the test should indicate no causality.

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42 C.W.J. Granger, *Investigating Causal Relations by Econometric Models and Cross-Spectral Methods*, 37 *Econometrica* 424 (1969); P. Newbold, *Causality Testing in Economics*, Bureau of Economic and Business Research, University of Illinois, Working paper No. 771 (1981); P.A. Cartwright, D.R. Kamerschen and M.Y. Huang, *Price Correlation and Granger Causality Tests for Market Definition*, 4 *Review of Industrial Organization* 79 (1989).

43 Cartwright (1989), *op. cit.*, at 83; Bishop and Walker (2002), *op. cit.*, at 445.

Empirical implementation of the test requires regression analysis,<sup>44</sup> in which the price of product Y is regressed both on its own past values, and on past values of X.<sup>45</sup> Results reflecting statistically significant causality would signify that price movements are correlated, namely, prices in one product or area are influenced by prices in another product or area, thereby suggesting that the products or areas may be part of the same antitrust market.<sup>46</sup>

It is important to note, however, that Granger causality is a specific econometric concept, and therefore the result of such a test does not necessarily imply causality in the normal legal sense of the word. The fact that the price of one product appears to Granger-cause the price of another product does not allow an immediate inference that they exert sufficient competitive constraint on each other to form part of the same relevant market. Even if the test is conducted properly,<sup>47</sup> it can only indicate that with certain statistical significance, the price of one product affects the price of another. Whether this product can restrain a 5% increase in the price of the other product has to be supported by additional evidence. As such, the test may at best provide ‘circumstantial evidence’, and not a decisive proof for relevant market inquiries.

Cointegration analysis examines whether two variables have a stable long-term relationship. The test compares two price series, and inspects whether they are stationary (i.e. have a constant mean and variance over time), under the presumption that substitutes in the same relevant market are cointegrated variables.<sup>48</sup> As with Granger causality, cointegration analysis is a non-theoretical

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44 Regression analysis is the principal tool of econometrics. Such an analysis asks how one variable (the so called ‘dependant variable’) is determined by a number of other variables (‘independent variables’). Using observed data, the regression analysis searches for the relationship between the dependant variable and the independent variables that best ‘explains’ the dependant variable. For an introduction to regression analysis see Bishop and Walker (2002), *op. cit.*, at Chapter 9.

45 For a mathematical description of the technique and its computational requirements see LECG (1999), *op. cit.*, at 59-60.

46 Note, however, that if there is statistically significant unidirectional causality, that is if, for example,  $P_A$  causes  $P_B$  but the reverse is not the case, then the two products/areas should not be in the same relevant market. If on the other hand there is a feedback effect, then both areas are assumed to be in the same relevant market. See Cartwright (1989), *op. cit.*

47 There are several analytical issues arising from the application of Granger causality tests in the context of market definition, which are too technical to be dealt with here. Among them is the fact that the literature does not recommend carrying out a proper Granger causality test, since a correctly specified test might reject the notion of product X Granger-causes product Y, even though they are both part of one relevant market. Another problem is the presence of auto-correlation, resulting from the fact that random shocks on prices often have effects that persist for more than one time period, and because past actions often influence current actions. For an elaboration on these problems, see Bishop and Walker (2002), *op. cit.*, at 450-451 and LECG (1999), *op. cit.*, at 60-61.

48 R.F. Engle and C. W. J. Granger, Co-integration and Error Correction: Representation, Estimation and Testing, 18 *Antitrust Bulletin* 45 (1987).

technique that does not involve making any preliminary assumptions regarding the dynamics behind the price adjustment mechanism. In addition, as with many statistical tests, a negative result may be more informative and simpler to understand than a positive one. This is because whereas insignificant statistical relationship can fairly exclude the existence of substantial competitive interaction between products, a positive test result cannot suffice to prove that the products belong to the same relevant market.<sup>49</sup>

From a technical perspective, it is often argued that standard tests to identify cointegrated series are of low statistic power.<sup>50</sup> Moreover, such tests are thought to mostly suit long-term relationships. Even in cointegrated series there could be considerable departures in the medium-term (possibly two years or more) from the long-term equilibrium, which might render it inapplicable for competition authorities who seek to establish the exercise of significant market power within a much shorter time interval.<sup>51</sup>

#### **4.5.1 The Use of Granger Causality and Cointegration Analysis in Competition Law Analysis**

Granger causality tests have rarely been carried out by the Commission in previous decisions. The test was nonetheless employed by the parties in *Mannesmann/Vallourec/Ilva*<sup>52</sup> to support their argument that the U.S., EU and Eastern Europe were part of the same relevant market for seamless stainless steel tubes.<sup>53</sup> If the test would have shown that the prices in region X do not Granger-cause prices in region Y, it would presumably prove that regions X and Y are separate relevant markets. However, test results indicated that those three regions were strongly linked. In particular, the test showed that EU and U.S. prices Granger-caused one another, while prices in Eastern Europe Granger-caused EU and U.S. prices (though the opposite effect had a lesser degree of statistical certainty). However, the Commission rejected these results, and in conjunction with other quantitative measures defined the market as Western European only.<sup>54</sup>

An additional illustration for employing causality tests in competition analysis appears in the case of the U.S. petroleum market. Cointegration techniques were

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49 The rationale is similar to that explained in the context of price correlations, particularly with regards the unsuitability of these methods for the formulation of the SSNIP test. See also LECG (1999), op. cit., at 60.

50 Bishop and Walker (2002), op. cit., at 453.

51 Id., at 454.

52 Case IV/M.315 Mannesmann/Vallourec/Ilva, (1994) OJ L 102/15.

53 Since this evidence is not mentioned in the Commission's decision, the discussion follows Bishop and Walker (2002), op. cit., at 448.

54 Case IV/M.315 Mannesmann/Vallourec/Ilva, (1994) OJ L 102/15, at para. 37.

employed to determine whether cities in the interior of the South-Eastern (SE) part of the U.S. constituted a separate geographic market for gasoline, or whether they belonged to a larger Eastern Coast market including also the North-East (NE), or even to a national market.<sup>55</sup> Although sources of supply and modes of transportation differed between the SE and NE, the two regions were connected by a common pipeline. It was, therefore, not possible to rule out that SE and NE formed a relevant market. In contrast, it was rather unlikely to stipulate a national market for petroleum products, since virtually no transportation of products between the East Coast (SE and NE) and the West Coast (WC) existed. Using weekly data on prices spread across an entire year, the analysis considered two cities in each region, and applied causality tests for exogeneity between each possible pair (15 pairs in total), to test whether prices in one city (statistically) caused prices in another.<sup>56</sup> The results of the tests for SE-NE were mixed. Exogeneity was rejected only in some of the pairs, implying that some interaction between the regions existed, but not nearly as strong as within the SE itself. For SE-WC pairs, the tests showed that the exogeneity hypothesis was never rejected. The empirical results confirmed therefore the initial intuition that the interior of the SE part of the U.S. was a local geographic market, loosely connected to the NE seaboard, and entirely separate from the WC.

Cointegration analysis as a test for market definition played a role in several Commission decisions, for instance *Gencor/Lonrho*<sup>57</sup> merger, and more recently in *CVC/Lenzing*.<sup>58</sup> In *Gencor/Lonrho*, cointegration tests were employed by the Commission in assessing the relevant product markets for platinum, rhodium, palladium, gold and silver. The results did not establish any long-term relationship between the respective price levels of platinum, rhodium, palladium, gold and silver, and confirmed the view that each of the above metals constituted a separate relevant product market. As specified by the Commission:<sup>59</sup>

“The Commission proceeded with a co-integration analysis of the data set of the prices of platinum, rhodium and palladium, as well as gold and silver prices. Co-integration analysis is an econometric method which can test whether there is a systematic equilibrium (or long-run) relationship between two or more time-series

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55 M. Slade, *Exogeneity Tests of Market Boundaries Applied to Petroleum Products*, 34 *Journal of Industrial Economics* 291 (1986).

56 In statistical terms, the analysis tested whether the hypothesis of exogenous price determination for city pairs within the SE had to be rejected. Rejection of this hypothesis could have indicated that these cities form part of a common geographic market for gasoline.

57 Case IV/M.619 *Gencor/Lonrho*, (1997) OJ L 11/30.

58 Case COMP/M.2187 *CVC/Lenzing*, (2004) OJ L 82/20.

59 Case IV/M.619 *Gencor/Lonrho*, (1997) OJ L 11/30, at para. 53.

of data. The results of the analysis show that the data do not suggest any equilibrium (or long-run) relationship between the respective price levels of platinum, rhodium, palladium, gold and silver, nor of any subset of these metals. This econometric analysis of metal prices indicates that platinum, rhodium, palladium, gold and silver prices tend to vary, over the long run, independently of each other, thus confirming the view that platinum, rhodium, palladium, silver and gold are separate relevant product markets”.

In CVC/Lenzing, cointegration tests were conducted to support the results of a price correlation analysis, which indicated high degrees of correlation between commodity viscose staple fibres (VSF) and spun-dyed VSF, and between commodity VSF and polyester. The Commission suspected that the above correlations were spurious, and might therefore overstate the scope of the relevant market. The analysis confirmed the above doubts, as it revealed that the high level of correlation between the products was attributed to a common trend and not to a real competitive interaction.<sup>60</sup>

Finally, the cointegration approach was applied to assess market definition in the case of *Continental Can*,<sup>61</sup> a U.S. Supreme Court historical opinion, and among the most debated ones. At hand was the 1956 acquisition of Hazel-Atlas Glass Company by Continental Can Company, companies which were active in the highly concentrated glass containers and metal can containers industries, respectively. The District Court dismissed the Government’s complaint as it found only one product line – metal and glass beer containers – in which the parties exhibited inter-industry competition. It further asserted that within this market, the merger was not shown to lead to a substantial lessening of competition. The Supreme Court rejected this definition. In an important precedent enveloping the concepts of interindustry competition, market definition and the relevance of long-term competition, the court established that competition existed between glass and metal containers also in industries other than beer, and hence defined the market as composing both glass and metal containers for all end uses.

In a recent study,<sup>62</sup> economists attempted to examine whether the U.S. Supreme Court’s market definition was correct, through an econometric estimation of the price differential between glass and metal containers. To do so, they constructed a model of the long-term equilibrium relationships that described the competitive interaction between these two industries. Among the six downstream

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60 Case COMP/M.2187 CVC/Lenzing, (2004) OJ L 82/20, at para. 109.

61 U.S. v. Continental Can, 378 U.S. 441 (1964).

62 L. Wu and D.M. Wu, Measuring the Degree of Interindustry Competition in U.S. v. Continental Can, 42 Antitrust Bulletin 51 (1997).



industries in which metal and glass containers were arguably competing inputs (i.e. canning, beer, soft drink, toiletries and cosmetics, medicine and health and the household and chemical industry), the analysis focused on the beer industry that most strongly relied on these types of containers at the time.

The economic analysis indicated that a high degree of competition existed between metal and glass containers, since it showed that changes in the price difference between the two products (as a result of a shock to one of the products' prices) were rapidly competed away within a relatively short period. For example, 72% of a shock to the price of metal containers disappeared within 1 year, and 93% within two years. This suggested that if firms in the metal industry raised prices by 5% in 1956, the price differential would have been arbitrated to 1.4% by 1957, 0.35% in 1958 and 0.25% by 1966. Such results were consistent with significant interindustry competition, as recognised by the U.S. Supreme Court over 30 years earlier, and implied that the two products belonged to the same antitrust market.<sup>63</sup>

#### 4.6 Trade Flows

In many competition law investigations, a fundamental issue is the existence of competitive pressures coming from other geographic regions. A potential source of information on the geographic boundaries of the market can be found in analysing the physical movement of goods. Observed patterns of trade flows may reveal that arbitrage is involved in the price determination mechanism, and may provide evidence that producers and consumers, spread over distinct regions, form one relevant market.

Two categories of tests address the competitive interaction across a number of regions and the extent to which a domestic producer faces significant competition from foreign suppliers. First, transport cost studies, which examine whether it will be profitable for potential competitors to supply a region under

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<sup>63</sup> An interesting comparison can be made with the analogous European Continental Can case that was decided in the 1970s, a period in which European courts scarcely engaged with economic analysis. The European Commission defined the market extremely narrowly, identifying three relevant product markets dominated by Continental Can: a market for light metal containers for canned meat products, a market for light metal containers for canned seafood, and a market for metal caps for the food packing industry. One may doubt whether such a definition would withstand economic scrutiny by modern quantitative techniques. The Commission's approach was heavily criticised and further annulled by the European Court of Justice, particularly its failure to properly account for supply substitutability. See Case 6/72 *Europemballage Corp. and Continental Can Inc. v. Commission*, (1973) ECR 215, at para. 32-36; *Re Continental Can Co. Inc.*, (1972) JO L 7/25. For further discussion of this case see D.E. Holt, *A Competition of Ideals: The Competition Policies of the European Union and the United States Compared*, *New England International and Comparative Law Annual* (1997).

a price increase. Second, shipment and trade pattern tests, which examine the strength of competition across regions by considering the actual level of production exported from a region, and the level of sales that is sourced from outside the region. The existence of substantial trade flow between two areas serves as an indication that consumers switch easily and readily between local and foreign suppliers, and is thought to be consistent with the two areas forming part of the same geographic market.

The advantages of trade flow tests addressed below are twofold. First, they are intuitive and their implications easy to grasp. Second, they are useful in places where adequate data and time are lacking, as their implementation requires only quantity, which is often available and simple to process. The main shipment and transport cost tests and their potential contributions to market definition are discussed in the following sections.

#### 4.6.1 Elzinga-Hogarty Test

The Elzinga-Hogarty<sup>64</sup> test is a commonly employed shipment test, based upon two thresholds: ‘LIFO’ and ‘LOFI’. LIFO stands for ‘little in from outside’, and considers whether imports into a region are small relative to total sales in that region. This is denoted by the following relationship:

$$\text{LIFO} = (\text{Production minus exports}) / \text{Consumption}$$

In this definition, consumption is equal to production minus exports plus imports minus changes in inventory stocks. The LIFO condition therefore establishes the degree to which a region’s consumption is based on local production rather than on imports. A high LIFO indicates that the demand in the region is primarily served by local production, and the region is thus thought to constitute a separate geographic market.

LOFI stands for ‘little out from inside’, and considers whether exports from a region are small relative to total production in that region:

$$\text{LOFI} = (\text{Production minus exports}) / \text{Production}$$

where a high LOFI indicates that there are few exports, and so the majority of the local production is used to serve the local market. This supports the proposition that the region is a separate relevant market.<sup>65</sup>

64 K. Elzinga and T. Hogarty, *The Problem of Geographic Market Definition in Antimerger Suits*, 28 *Antitrust Bulletin* 45 (1973).

65 If the inventory level is constant over time, the LIFO and LOFI conditions are presented commonly as follows:  $\text{LIFO} = 1 - (\text{Imports}) / (\text{Consumption})$ ;  $\text{LOFI} = 1 - (\text{Exports}) / (\text{Production})$ .

In general, if trade patterns observed in a region fail either the LIFO or LOFI conditions, this testifies that the region is subject to external competition. Put differently, local producers are effectively constrained by producers from outside the region, thereby suggesting that the candidate market should be expanded.<sup>66</sup>

## 4.6.2 Shortcomings of the Elzinga-Hogarty Test

### 4.6.2.1 Determination of the LIFO and LOFI Thresholds

There is no obvious level of imports and exports of goods that will reliably gauge the competitive constraints between regions, in order to include them in the same geographic market. Elzinga and Hogarty proposed two critical values for the LIFO and LOFI conditions: both should reach 0.75 or alternatively 0.9.<sup>67</sup> Yet, as many scholars have pointed out, the choice of threshold is arbitrary and depends on the circumstances of every specific case.<sup>68</sup>

### 4.6.2.2 Interpretation of the Results

Analysis of shipment data can provide useful information regarding the competitive interaction between suppliers from different regions. In principle, if observed trade flow patterns indicate a high level of imports, this suggests that firms outside the region effectively restrain pricing inside that region. Particularly, a high level of imports means that many of the 'local' consumers buy from 'non-local' producers, implying that the latter are able to readily serve the region, since barriers for trade between the regions are absent or low. In merger investigations, for example, such evidence may indicate that any price increase by local producers is likely to be defeated by external suppliers and hence rendered unprofitable. Similarly, if trade flow patterns reflect a substantial level of exports from a region, this may also suggest the existence of inter-regional competitive constraints and suggest that the market is wider than the region itself.

However, interpreting the Elzinga-Hogarty test results is not always straightforward, and may not be easily transferred into sufficiently credible proof for geographic market delineation. No volume of physical movement will ensure that two areas truly constrain one another against a price increase, and both the absence and presence of significant trade flow between regions is insufficient to establish that the regions are or are not part of the same relevant market. In

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66 Bishop and Walker (2002), *op. cit.*, at 408.

67 Elzinga and Hogarty (1973), *op. cit.*

68 Stigler and Sherwin (1985), *op. cit.*, at 580; Bishop and Walker (2002), *op. cit.*, at 408; Kaserman and Zeisel (1996), *op. cit.*, at 670.

specific, it may often be the case that results of the test are not clear-cut, and do not generate obvious market definitions. On the one hand, substantial trade flow between two distinct markets may not eliminate price disparity across them, if the regions are subject to price discrimination.<sup>69</sup> On the other hand, the absence of trade flow should not necessarily be taken to mean that the market has to be narrowly defined. Indeed, low trade flow between regions can be attributed to several different factors, which may include high transportation costs that limit the transformation of commodities and the existence of legal obstacles such as tariffs or quotas, which reduce the effectiveness of competition between regions. But it should be also considered that low trade flow, contrary to the presumption of low competitive interaction, may actually stem from a high degree of competition between different regions. If cross-price elasticity of demand between regions is high<sup>70</sup> and transportation costs are low, local producers are constrained by foreign producers. As consumers are able to import the product cheaply from outside the region, every potential local price increase will be defeated by decreasing demand for the product. In these circumstances, local producers are unlikely to increase prices, and the result is none or very little trade flow between the regions. The Elzinga–Hogarty test ignores these factors and fails to incorporate the notion of cross-elasticity of demand between regions. Under the conditions described above, a shipment test may falsely indicate that the lack of trade flow between regions alludes to separate geographic markets, while in fact the regions do impose significant competitive constraints on one another.<sup>71</sup>

An additional complication occurs when only one of the LIFO/LOFI conditions is met. How should the analyst interpret a test result when either condition has failed? If exports into the region are high, but imports are low, the economic reasons behind it should be understood. Such a situation may still be settled with a wider market, as the existence of exports testify on feasible transportation costs, but the market may as well be narrow if there are imports asymmetries between the regions like tariff barriers. It is therefore important to validate any conclusion with additional evidence.<sup>72</sup>

Finally, the test is indefinite in determining the extent of the relevant market, and does not answer the key question, whether a hypothetical monopolist can profitably impose a SSNIP on the candidate region. In this respect the Elzinga–

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69 Stigler and Sherwin (1985), *op. cit.*, at 580; Kaserman and Zeisel (1996), *op. cit.*, at 670.

70 The cross price elasticity is defined as the percentage change in the quantity demanded of one product resulting from a one percent increase in the price of another product. See Pindyck and Rubinfeld (2005), *op. cit.*, at 34. The concept is addressed in Chapter 2 of this book.

71 Bishop and Walker (2002), *op. cit.*, at 415-417; Kaserman and Zeisel (1996), *op. cit.*, at 670.

72 Bishop and Walker (2002), *op. cit.*, at 416 As observed by the European Commission in Case IV/M.315 Mannesmann/Vallourec/Ilva, (1994) OJ L 102/15, at para. 33: “this test is widely regarded as questionable in particular because it does not give any indication with respect to mutual interpenetrations between the different areas considered”.

Hogarty test is imprecise, and basically suffers from the same shortcomings of price correlation analysis. It merely provides a general starting point to assess the relevant geographic market, rather than a dispositive proof, and should be always undertaken in conjunction with other methods.

#### 4.6.3 Transport Cost Tests

Evidence as to the magnitude of transport costs between regions highlights the feasibility of transferring goods between different geographic locations. High transport costs usually imply that competition between regions is at best weak, and can be utilised to explain why trade between regions is economically impractical. Yet high transport costs cannot *per se* prove that competition between two regions is infeasible.<sup>73</sup> In particular, a region that was previously unsupplied by non-local producers may become supplied after the price increase despite high transport costs, because the provision turns out to be profitable for foreign producers.

Consider, for example, a product B, which is too expensive to be transported from a neighbouring region to substitute the local product A at its current price. If, however, the price of A is further increased by 5%, importing B into the region may become a viable alternative. In a merger investigation, data on the transport costs of product B may help to assess the likelihood of a post-merger price increase.

Typically, transport costs studies are employed to supplement shipment data in the implementation of a SSNIP across regions. In order to quantify the impact of a price increase on the extent of a geographic market, the test usually calculates the magnitude of transport costs relatively to the value of the product (as a percentage of sales revenues). Further, the test considers the effect of a price increase in a certain region, by examining the incremental transport costs of providing to this region, versus the extra sales revenue from selling there. That way, that test can make inferences concerning the extra distance a firm would be willing to go and ship to, following a potential price rise.<sup>74</sup>

As a final observation, it is important to keep in mind that transport cost tests cannot determine whether firms will actually go the extra distance and ship products to regions that were not supplied before. These tests can only evaluate the potential response of producers. Nor do they tell us whether the amount of extra shipping would render the price increase unprofitable, unless additional calculations are taken.<sup>75</sup>

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73 For example, if one area enjoys a relative cost advantage in production, it may supply areas with higher costs of production, despite seemingly significant costs of transportation.

74 Lexecon (1999), *op. cit.*, at 23; Bishop and Walker (2002), *op. cit.*, at 418-419.

75 Those may include estimating the elasticity of demand in order to quantify the reduction in demand following a price increase. See Lexecon Ltd. (1999), *op. cit.*, at 24; Alternatively, N. Strand, A Simple

#### 4.6.4 The Use of Shipment Tests in Competition Law Analysis

##### *Nestlé/Perrier*<sup>76</sup>

Measures of imports and exports are frequently invoked to aid the determination of the geographic boundaries of a market. One example is Nestlé /Perrier, where the parties as well as the Commission relied on trade patterns studies to ascertain the size of the relevant market. Nestlé representatives in this case have performed an Elzinga-Hogarty shipment test, to assess whether the relevant market was limited to France, or should be broadened to include its neighbouring countries. The test showed that the LIFO condition was always met: 90% of all bottled water sold in France was produced by domestic firms. However, the LOFI condition did not apply, and the analysis indicated that exports were in excess of 10%.<sup>77</sup>

On this basis, Nestlé argued that the level of exports from France to other areas should be taken into account in the market definition. According to Nestlé, price discrimination between France and the areas where it sold abroad was not possible, at least in relation to Belgium and certain parts of Germany. Therefore, its pricing in France would be restrained by the conditions prevailing in these other markets where Nestlé was present, although conditions of competition in the latter markets differed substantially. Moreover, it was argued that if excessive prices were to be applied in the French market, parallel imports into France would develop. The mere threat of parallel imports, according to Nestlé, would jeopardise any dominant position in the French market, therefore supporting a wider market definition.

The Commission, however, rejected this analysis. Notwithstanding the trade patterns reflected in the above studies, the Commission concluded that in view of the different competitive environment prevailing in each Member State, the practical impossibility to develop parallel imports, the high impact of transport costs of water over long distances, and the absence of potential competitors able to overcome substantial barriers to entry into the French market, the relevant geographic market remained France, and should not be extended.

##### *Saint-Gobain/Wacker-Chemie/NOM*<sup>78</sup>

In Saint-Gobain/Wacker-Chemie/NOM, a proposed joint venture between three European companies for the production and sale of silicon carbide (SiC), trade patterns tests had a constructive role in building up the Commission's geographic

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Critical Loss Analysis for the Geographical Market, 2 Journal of Competition Law and Economics 697 (2006), formulates the 'critical loss' (discussed below) threshold for geographic market definition when transport costs are high.

76 Case IV/M.190 Nestlé/Perrier, (1992) OJ L 356/1.

77 Lexecon has performed economic analysis for Nestlé in this case: See Lexecon (1999), op. cit., at 23.

78 Case IV/M.774 Saint-Gobain/Wacker-Chemie/NOM, (1997) OJ L 247/1. See also the case discussion in Bishop and Walker (2002), op. cit., at 412-413.

market definition for each of the product markets considered. After identifying five separate SiC markets, the Commission went on to define the corresponding relevant geographic markets, most interesting among them were the markets for SiC for metallurgical purposes, crude crystallised SiC, and SiC for abrasive applications.

Concerning SiC for metallurgical purposes, the Commission concluded that the relevant market was worldwide. Official import statistics demonstrated that SiC for metallurgical purposes was characterised by sizeable imports into the EEA, which accounted for about 50% of the market value in 1995. Having the EEA heavily supplied by external producers implied that the EEA itself could not constitute a relevant market, since it was effectively constrained by competition from outside the region.

With respect to crude SiC, the final determination of the geographic market was left open, as the proposed concentration did not create or strengthen a dominant position for this product even if the market was narrowly defined to be the EEA. The Commission nonetheless pointed out that the observed high import share of 85% constituted a strong presumption that the market was in fact wider than the EEA, since again any local increase in price would be eroded by outside competition.

Concerning SiC for abrasive applications, the Commission estimated the impact of imports into the EEA to be 14.4-15% of the market value, compared to the parties' estimation, which amounted to 15-20%. Interestingly, however, the Commission further determined that the relevant geographic market should not be larger than the EEA.

This latter conclusion, by which imports into the region amounting to 15% of total consumption did not imply expanding the candidate market, merits further discussion. As discussed above, a commonly accepted threshold for the LIFO criterion is 0.9, namely a region in which 90% of the total consumption is provided by domestic producers will be regarded as a separate relevant market. Hence, a 15% level of imports should generally be taken to mean that the LIFO criterion is not met, since imports into the region are significant. Yet, as previously observed, the Elzinga-Hogarty threshold is somewhat arbitrary, and a value of 0.85 can reasonably be interpreted one way or another, to sustain contradictory market definitions. Having 15% of a region's consumption supplied from outside is somewhere in the grey zone, and may at the same time satisfy both the conclusion of the EEA being a relevant market on its own, as well as the opposite conjecture that market boundaries should be broadened.

In this case, the Commission rightly noted<sup>79</sup> that in evaluating whether imports are an indicator of a wider geographic market, it is not enough to simply evaluate the magnitude of the import share. The important question remains the competitive impact of imports, and in particular, whether imports signify wider market integration in terms of price-setting and general competitive conditions. This question could be answered only as part of a full investigation of overall market conditions, accounting among others for differences in product characteristics, product quality, industry standards, price levels and price trends applicable between the regions, as was done in that case.

### ***Barloworld Coatings/Midas Paints***<sup>80</sup>

Most recently, shipment tests played a leading role in the South-African merger case between Barloworld Coatings, a large player in the national market for decorative paint, and Midas Paints which operated primarily in the Western Cape. Of interest in the investigation was the relevant geographic market, ultimately defined as national, based among others on the results of the Elzinga-Hogarty test. In particular, an analysis of product flow between different South-African provinces has shown that Western Cape paint producers faced significant competition from producers located in other regions, to the extent that the market had to be considered nation-wide. The results of the Elzinga-Hogarty test are presented in the following table:<sup>81</sup>

**Table 1.** Trade Flow between South-African Provinces

	Gauteng	KwaZulu-Natal	Western Cape	Other Provinces
% of consumption imported from other provinces	30.4%	60.6%	66.2%	100%
LIFO 1 – (Imports / Consumption)	0.70	0.39	0.34	0
% of production exported to other provinces and neighbouring countries	55.6%	78.7%	30.7%	No production
LOFI 1 – (Exports / Production)	0.44	0.21	0.69	–

79 Case IV/M.774 Saint-Gobain/Wacker-Chemie/NOM, (1997) OJ L 247/1, at para. 130.

80 The case is discussed in Econex, Quantitative Techniques in Competition Policy – The Elzinga-Hogarty Test, Research Note 3 (May 2006).

81 Id., at 2.



The table depicts two important patterns concerning trade flow of decorative paint in South-Africa:

- (1) A large share of the consumption in each one of the provinces was imported from outside the region.
- (2) A large share of the production in Gautend, KwaZulu-Natal and the Western Cape was exported to other regions.

Accordingly, the LIFO and LOFI values were evidently too low to support the conclusion of regional (provincial) geographic market definitions. Evidence of such a significant trade flow between the provinces advanced the proposition of a national market definition, implying therefore that local producers were restrained in their ability to increase price in the face of likely responses of suppliers from other regions.

#### **4.7 Demand Analysis**

As dictated by microeconomic theory, the extent to which an individual firm can exercise market power depends on the demand curve it is facing. If the demand faced by the firm is relatively inelastic, the firm can afford to increase the price further without sacrificing a substantial amount of sales. If, on the other hand, demand is elastic, the lost revenue will defeat any attempted price increase, since any deviation from the current price will induce a significant loss in sales.

The analysis of demand concerns an investigation into the nature of the particular demand curve faced by the firm. The demand curve contains valuable information for antitrust inquiries, and specifically for the market definition assessment. If the merits of demand were known, the market could be directly defined, and implementing the SSNIP test would simply become a matter of reading the change in quantity after a 5% price increase on the demand curve and computing the profitability of such a change. Thus, in contrast to indirect techniques such as price movements and shipment patterns presented here, the analysis of demand is directly linked to the market definition question, and may be used to define antitrust markets, as opposed to economic markets.

In particular, demand analysis aims at estimating the two most important demand elasticities: own-price elasticity of demand, and cross-price elasticity of demand, both vital for competition law assessments. The former measures the percentage decrease in sales corresponding to a 1% increase in price, while the

latter measures the percentage sales diverted to substitute products following the same price increase. Information on the magnitude of demand elasticities is pertinent to the market definition process, and may prove decisively as to whether a firm or a group of firms can impose a non-competitive price increase for its product.

An estimation of the demand system seeks to identify the demand curve faced by the firm. The latter expresses the quantity of the product as a function of its price, the price sold of various other products (including actual and potential substitutes) and a group of demand-shift variables (e.g. consumers' income, preferences).<sup>82</sup> To implement the technique, a panel which includes multiple observations from the market under investigation is required.<sup>83</sup> Often, observations will be drawn from several geographic locations, and at a number of times (i.e. weeks, months, quarters or years).<sup>84</sup> Once the demand curve is constructed, own-price and cross-price elasticities can be obtained.

Nonetheless, even when sufficient data is available, demand analysis is considered a challenging technique resulting from the analytical tools required for its performance. When demand elasticities are econometrically estimated, two important methodological issues typically emerge. The first concerns the question which demand model should be used in the analysis. The second is known as the 'identification' problem, or the problem of simultaneous determination of prices and quantities. While the latter topics are rather technical, they are fundamental for the analysis, and are thus addressed briefly below.

#### **4.7.1 The Choice of Demand Model**

A demand model, or as termed in economics, a 'functional form', specifies the interrelation between quantities sold and prices charged on the relevant market. In an ordinary demand specification procedure, the analyst collects data on the prices at which the product is sold, the number of units sold at each time period, and additional factors which may affect the sales, e.g. promotional activity and prices of competing products. On the basis of these observations, the analyst constructs a statistical relationship between the quantity of the good purchased

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82 Note, however, that the most common regression models use the inverse demand function, which expresses the price charged as a function of the quantity sold,

83 It is customary to use scanner data from a number of distribution channels in antitrust investigations (e.g. supermarkets, drug stores) and from different areas. Leading companies which collect and sale this data are A.C. Nielsen (Nielsen) and Information Resources Incorporated (IRI).

84 D.L. Rubinfeld, *Market Definition with Differentiated Products: The Post/Nabisco Cereal Merger*, 68 *Antitrust Law Journal* 163, 170 (2000).

and the factors which affect its sales. Within this estimation process, the analyst is confronted with the choice of a demand system or the mathematical formula that best describes this demand relationship.

For example, the analyst may assume that demand is linear, or alternatively that the demand function features constant elasticity. Naturally, any assumptions made at this stage may be critical for the ensuing antitrust analysis, as the predicted consumers' reaction to a hypothesised price increase can significantly differ according to the model used.<sup>85</sup>

One possibility is to opt for a linear functional form, whereby changes in the quantity sold of a certain product are proportional to changes in its price.<sup>86</sup> Economic literature recognises, however, that linear demand systems are not well grounded in standard economic utility theory, and furthermore suffer from a number of inherent problems which may undermine the validity of their results.<sup>87</sup> Most importantly, while it is expected that the model would generate a positive prediction for the cross-price elasticity between the product under investigation and a substitute product, the estimated parameter may sometimes have an incorrect sign (i.e. the estimated cross-price elasticity will be negative).<sup>88</sup>

A possible alternative is to use a log-linear functional form.<sup>89</sup> Such a demand system has the advantage that the estimated coefficients on each price variable are directly interpreted into the relevant elasticities.<sup>90</sup> However, this model also suffers from several shortcomings,<sup>91</sup> primarily related to its constant-elasticity assumption, which implies – contrary to the theory underlying consumers' choice – that demand does not become more elastic as one moves upwards on the demand curve.

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85 P. Croke, L. Froeb, S. Tschantz and G.J. Werden, *Effects of Assumed Demand Form on Simulated Postmerger Equilibria*, 15 *Review of Industrial Organization* 205 (1999).

86 Consider the following demand function:  $Q = 100 + \beta P$ . Assuming, for example, that the variable  $\beta$  is equal to -2, any change in the product's price would lead to a twice as much decrease in its quantity demanded. This relation between price and quantity remains constant along the demand curve, regardless of the level of price or quantity.

87 D. Hosken, D. O'Brien, D. Scheffman and M. Vita, *Demand System Estimation and its Application to Horizontal Merger Analysis*, FTC Working Paper (April 2002).

88 In addition, when the model is used for merger simulation, it may sometimes generate negative values of the predicted quantities. See Croke et al. (1999), *op. cit.*, at 209.

89 Technically speaking, this is done by regressing the natural logarithms of the quantity variables on the natural logarithms of the price and demand-shifting variables.

90 Consider, for example, the following equation:  $\text{Sales} = 50 - 2\text{Price} + \text{Error term}$ , which implies that a price rise by one unit results in a 2 units decrease in sales. If, however, the variables were in logs, the model would be interpreted differently: a price rise of 1% would then mean a 2% sales decrease.

91 Hosken et al. (2002), *op. cit.*, at 13.

Moreover, apart from the econometric issues arising in the estimation procedure, the latter models pose a practical difficulty associated with the need to take into account numerous parameters in the estimation procedure. The problem is most noticeable in differentiated products' industries, where the existence of a large number of substitutes requires the inclusion of too many variables in the demand equation.

An arguably superior alternative to the linear and log-linear demand models is the Almost Ideal Demand System, or AIDS,<sup>92</sup> nowadays widely accepted among antitrust practitioners. However, apart from its improved econometric properties, this model also requires the estimation of a large number of parameters affecting the demand function.

Consider, for example, the breakfast-cereals industry, which necessitates the inclusion of more than 20 different factors in every demand equation. The complexity of such an equation renders it impractical, due to the difficulty of distinguishing between the different effects of a large number of variables, and tends to perform badly and generate imprecise coefficients and inconsistent estimations.

To tackle this problem, economists have explored a variety of ways to strike a balance between theoretical rigor, practicality, and the ability to generate trustworthy predictions based on the available data. Several economic models have purported to answer to these conditions, by restricting the number of parameters included in the analysis.<sup>93</sup> One approach to limit the parameters of the demand system is to impose separability assumptions. As a result, the demand features a multi-level decision-making process.<sup>94</sup> Even if there are 30 prices of

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92 A. Deaton and J. Muelbauer, *An Almost Ideal Demand System*, 70 *American Economic Review* 312 (1980); J. Hausman, G. Leonard and J.D. Zona, *Competitive Analysis with Differentiated Products*, 34 *Annales D'Economie et de Statistique* 159 (1994).

93 E.g. the logit model. G.J. Werden and L. M. Froeb, *The Effects of Mergers in Differentiated Products Industries: Logit Demand and Merger Policy*, 10 *Journal of Law, Economics and Organization* 407 (1994); G.J. Werden, L.M. Froeb and T.J. Tardiff, *The Use of the Logit Model in Applied Industrial Organization*, 3 *International Journal of the Economics of Business* 83 (1996). Note that while the logit model greatly restricts the own-price and cross-price elasticities, other models which allow more flexibility in substitution patterns exist. See S.T. Berry, *Estimating Discrete-Choice Models of Product Differentiation*, 25 *Rand Journal of Economics* 242 (1994); S. Berry, J. Levinsohn and A. Pakes, *Automobile Prices in Market Equilibrium*, 63 *Econometrica* 841 (1995); A. Nevo, *Mergers with Differentiated Products: The Case of the Ready-to-Eat Cereal Industry*, 31 *Rand Journal of Economics* 395 (2000); R.J. Epstein and D.L. Rubinfeld, *Merger Simulation: A Simplified Approach with New Applications*, 69 *Antitrust Law Journal* 883 (2001). For a general overview of the commonly utilised demand systems and their economic properties see ; J.A. Hausman and G.K. Leonard, *Competitive Analysis Using a Flexible Demand Specification*, 1 *Journal of Competition Law and Economics* 279 (2005), and Hosken et al. (2002), *op. cit.*

94 Rubinfeld (2000), *op. cit.*; Bishop and Walker (2002), *op. cit.*, at 354-355.

30 substitute products, not all of them have to be simultaneously incorporated in each equation. Instead, the demand system estimates 'segment equations' which divide the products into narrower segments, based on the principal of 'multi-staged budgeting'. This holds that consumers' purchasing decisions can be broken down into a number of separate 'branches' of the 'tree structure', which are separable from the demand for products in other branches.

Suppose, for example, a three-staged decision-making process. In the first stage the consumer decides whether or not to buy the product type (e.g. a foreign holiday). In the second stage the consumer chooses the segment of industry from which to purchase the product (e.g. land-based holiday, cruise ship). In the third stage the consumer chooses the specific type he or she prefers (e.g. hotel, camping site). Likewise, the demand for breakfast cereals may compose of a top level, where the consumer determines the demand for a cereal over an alternative 'breakfast' product. The second level includes a choice between different cereal categories (Kid cereals, Healthy cereals), whereas the third level consists of the selection of a specific brand.

In this structure, at each one of the levels of choice a demand system is being constructed. At the upper level the model estimates the demand for the market as a whole (e.g. all holidays). In the middle level, the model considers the demand for segments within the market, and estimates the corresponding elasticities. At the lowest level, the model generates estimations for the particular elasticities for unique brands within each segment. The results from all three levels are then combined in order to assess the own-price elasticity and cross-price elasticity for each product.<sup>95</sup>

Such a modelling strategy is almost invariably adopted in mergers between different product's brands, as the merging firms typically face numerous rivals. However, notwithstanding its simple intuition and analytical tractability, it is important to acknowledge that whilst reducing the number of parameters in the model facilitates workability, the results may be sensitive to the restrictions imposed. A decision to include a product in one segment rather than another may substantially affect the conclusion reached about the closeness of substitution between products, and may therefore significantly alter the resulting definition of the relevant market.<sup>96</sup>

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95 Note that a credible analysis is expected to show that the overall industry elasticity is lower than the segment industry, which in turn is lower than the distinct elasticities in the third level. That is because people are thought to be less sensitive to choosing, for example, between different types of cars than choosing between buying a car or a motorcycle, and further to choosing between buying a car or using the public transportation. See A. Deaton and J. Muellbauer, *Economics and Consumer Behavior*, Cambridge (1980), at Chapter 16.

96 Rubinfeld (2000), *op. cit.*, at 174.

#### 4.7.2 The Identification Problem

In an economic model, an endogenous change is one that comes from inside the model and is explained by the model itself. For example, in the simple supply and demand model, a current change in price ‘explains’ a current change in quantity. However, a change in consumer tastes or preferences is an exogenous change, which shifts the demand curve and leads to a new equilibrium price and quantity.

When a demand function is estimated, the analysis utilises multiple observed pairs of quantity and price, each depicting a particular intersection of the demand and supply curves from a certain geographic location, or at a certain point in time. However, this presents the econometric problem of ‘simultaneity’ or ‘endogeneity’, by which the demand function includes endogenous variables. As a result, the estimation procedure might fail to identify the ‘real’ demand relationship, and will result in biased estimators (i.e. incorrect coefficients) of demand elasticities.<sup>97</sup>

To truly be able to isolate the demand function, one approach is to seek ‘instrumental variables’, namely exogenous variables which proxy the endogenous variables in the demand relationship. In many cases, when the endogenous variable is a price variable, it will be replaced with a set of cost-shifters such as the prices of the inputs used for production. A change in input prices presents a shock to supply external to the demand system, and hence allows identifying when changes in price and output are attributed to changes in supply.

To illustrate, one may contemplate a firm  $i$ , which faces the following demand function:

$$(1) \quad Q_i = Q(P_i, X, Y)$$

where  $Q$  is the quantity sold by the firm,  $P_i$  is the price it charges,  $X$  is a cost-shift variable affecting the firms rivals, and  $Y$  is a demand-shift variable affecting the behaviour of the firm’s consumers (e.g. income or preferences).

The problem with such an equation is that both  $Q_i$  and  $P_i$  are endogenous, namely simultaneously determined in the interaction of demand and supply. Hence, in order to obtain an unbiased estimation of demand, it is necessary that the quantity demanded could be explained by exogenous variables that are independent of the quantity. This can be achieved if all endogenous right-hand variables are proxied with a set of exogenous variables. For example, instead of using a price (endogenous) variable to determine the quantity, it is possible to instrument it with a set of cost-shifters (i.e. input costs).

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97 Rubinfeld (2000), op. cit., at 171-172; Hosken et al. (2002), op. cit., at 17-18; Bishop and Walker (2002), op. cit. at 356.

Hence, the demand problem can be re-formulated. In the following equations,  $Z$  denotes a cost-shift variable which only affects the costs of the firm  $i$ , not the costs of its rivals'. Since  $Q_i$  and  $P_i$  are determined simultaneously in the market mechanism, and since they both depend on  $Z$ , the problem can be expressed as following:

$$(2) \quad Q_i = Q(Z, X, Y)$$

$$(3) \quad P_i = P(Z, X, Y)$$

In these equations, the left-hand variables ( $Q_i$  and  $P_i$ ) are a function of independent right-hand variables, by which they are not influenced.<sup>98</sup> Unfortunately, on many occasions the number of cost-shifters is small, and more critically, fewer than the number of endogenous prices. In this case, identification will only be made possible if additional assumptions are introduced into the demand model.<sup>99</sup>

Estimation procedures sometimes operate under the assumption that a price of a product in one region serves as a valid instrumental variable for prices of the same product in another region.<sup>100</sup> Such an approach implicitly presupposes that prices in different regions face the same cost shocks, but different demand shocks, and hence price data collected in one city can replace prices in another city. Some commentators have noted, however, that if the demand shocks across different regions are correlated,<sup>101</sup> the ensuing econometric estimation would be biased.<sup>102</sup>

### 4.7.3 The Importance of Price Elasticities in Competition Law Analysis

#### 4.7.3.1 Own-Price Elasticity of Demand

As elaborated in Chapter 1, the ability of a firm to exert market power depends on the extent to which consumers are willing to substitute the product. Whilst all products naturally have substitutes, the point of interest is whether enough

98 LECG (1999), *op. cit.*, at 70-72.

99 Rubinfeld (2000), *op. cit.*, at 171; Hosken et al. (2002), *op. cit.*, at 17-18; Bishop and Walker (2002), *op. cit.*, at 347 and 356.

100 Hausman et al. (1994), *op. cit.*

101 For example, because advertising affects consumers' preferences across cities.

102 T. Bresnahan, *The Apple Cinnamon Cheerios War: Valuing New Goods, Identifying Market Power, and Economic Measurement* (1997), at 4-5. Available at: <http://www.stanford.edu/~tbres/research/hausman%20recomment.pdf>; T. Bresnahan, *Valuation of New Goods under Perfect and Imperfect Competition: Comment*, *The Economics of New Goods: NBER Studies in Income and Wealth Number 58*, The University of Chicago Press (T. Bresnahan and R.J. Gordon, eds., 1997), at 241-242; Nevo (2000), *op. cit.*, at 418; Bishop and Walker (2002), *op. cit.*, at 356.

consumers would switch on the occasion of a price increase. Recognising that the key to market power is the degree of substitution, the SSNIP test asks what the narrowest range of products is, such that the hypothetical monopolist of the group could permanently and profitably raise prices by a small but significant amount. This range of products constitutes a relevant market.

In fact, what matters for market delineation is the behaviour of the so-called ‘marginal’ consumers, who may adjust their demand behaviour in accordance with the price. These consumers are price elastic, namely they are willing to purchase the good at its current price but may switch to other goods upon a price increase. The latter are different to ‘infra-marginal’ or ‘inelastic’ consumers, who are satisfied with the good even with a higher price. The question of market definition therefore becomes one of recognising the share of marginal consumers out of the total number of consumers purchasing the product. The larger the fraction of demand attributed to marginal consumers, the less likely it is that the price increase would be sustainable.<sup>103</sup>

This question can be answered directly by estimating the demand elasticity. Particularly in merger cases, where the potential price increase is judged against the prevailing price, price elasticity of demand can be utilised to indicate whether a post-merger permanent price increase of 5-10% can be maintained by the merged entity, and whether the demand is sufficiently inelastic so that consumers will stick to the product albeit the elevated price.<sup>104</sup>

As already mentioned, the own-price elasticity of demand measures the percentage change in the quantity demanded of product X when the price of X is changed by 1%. If the absolute value of the elasticity is lower than one, the quantity demanded would decrease by a percentage lower than the price. If the absolute value of the elasticity is more than one, the quantity demanded would drop by a percentage greater than the price. For example, a value of -0.5 for the own-price elasticity indicates a 0.5% fall in the sales of the product for every 1% increase in its price. Likewise, a value of -2 for the elasticity implies that every 1% price increase would induce sales to fall by twice as much.

Importantly, two economic factors will determine the profitability of a unilateral price increase by the hypothetical monopolist.<sup>105</sup> On the one hand, as the price goes up, some consumers at the margin switch to alternative products outside the provisional market, whereas the remaining consumers now pay a higher

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103 Stenborg (2004), *op. cit.*

104 In cases of abuse, as previously discussed, the appropriate benchmark is the competitive price level, which is much more difficult to detect, and which therefore renders the application of the SSNIP test dubious.

105 Bishop and Walker (2002), *op. cit.*, at 357-358.



per-unit price. The number of consumers switching to substitutes, and hence the change in revenue, is determined by the own-price elasticity of demand. On the other hand, the firm's profits after a price increase are also affected by the extent of any saving in production costs resulting from the reduction in sales. Consequently, the profitability of a price increase is determined by the revenue gained for all the units sold at the higher price, in conjunction with any cost savings on units forgone. Any price increase is profitable if the second effect outweighs the first. In fact, a price increase might result in a substantial loss of sales for the hypothetical monopolist, but at the same time may imply sufficient cost savings. As long as the volume of sales fall, but costs fall even further, the price rise may still be profitable.

The following example may illustrate this point. Assume that the current price of product X is 10, and the amount of units sold is 100. The estimated own-price elasticity of demand is equal to -3, the cost of producing one unit is constant and equal to 5, and there are no fixed costs. Under these conditions, the production of X yields a revenue of 1,000 ( $10 \times 100$ ), and costs 500 ( $5 \times 100$ ). The hypothetical monopolist is thus making a total profit of 500 ( $1,000 - 500$ ). The question is, would it be profitable to further increase the price by 5%?

To answer this question, account should be taken of all the changes in all relevant factors. This is summarised in the table below:

**Table 2.** Effect of a Hypothetical Price Rise on Profits

	Before price increase	After price increase
Price	10	10.5
Number of units sold	100	85
Revenue	1,000	892.5
Costs	500	425
Total profit	500	467.5

Following a price increase of 5%, the new price is set to be 10.5. A given value of -3 for the elasticity of demand implies that when the price increases by 5%, sales should drop by 15% ( $5 \times 3$ ), which brings the quantity sold down to 85 units. The new revenue is thus 892.5 (85 units sold for 10.5 each), whereas the costs are 425 ( $85 \times 5$ ). In total we can observe that the profit after the price increase is lower than the original profit, which implies that a 5% increase is not profitable under current market conditions.

Now suppose that the estimated own-price elasticity was equal to 0.5. In this case, a price increase would have been profitable, since sales were expected to drop only by 2.5%:

**Table 3.** Effect of a Hypothetical Price Rise When Elasticity Is Low

	Before price increase	After price increase
Price	10	10.5
Number of units sold	100	97.5
Revenue	1,000	1,023.75
Costs	500	487.5
Total profit	500	536.25

As a final observation, suppose that production costs in the original example were 8 per unit, rather than 5. Given that the estimated own-price elasticity of demand is equal to -3, total profits calculated after the price rise indicate that production costs savings outweighed the lost revenues:

**Table 4.** Effect of a Hypothetical Price Rise When Costs are High

	Before price increase	After price increase
Price	10	10.5
Number of units sold	100	85
Revenue	1,000	892.5
Costs	800	680
Total profit	200	212.5

#### 4.7.3.2 Critical Elasticity

The illustration above shows how profits can shift in either direction after a price increase, depending on the magnitude of demand elasticity, and the extent of cost savings. To reach a decisive conclusion as to the effect of a price increase in any given set of market conditions, it would be valuable to derive the critical level of substitution that is needed to constrain the profitability of a 5% price increase.

Such a formula can be obtained by using both the own-price elasticity of demand, and the price-cost margin of the firm at the prevailing price.<sup>106</sup> The own-price elasticity provides an indication of all possibilities for substitution, while the price-cost margin accounts for the implications of the decline in sales. Furthermore, based on the profit maximisation condition of the monopolist, it is possible to assess the level of own-price elasticity above which a price increase is no longer profitable. Calculating this elasticity will allow a definitive conclusion to be drawn as to whether the collection of products constitutes a relevant market, and above which level the proposed market definition has to be broadened.

The threshold demand elasticity for the profitability of a price increase (above which a price increase is rendered unprofitable) is called *critical elasticity of demand*, that is, the highest elasticity of demand the hypothetical monopolist could face and still want to increase prices by 5%.<sup>107</sup> Once the critical elasticity has been calculated, it is compared with the prevailing elasticity in the candidate market. If the prevailing elasticity of demand for the collection of products under the hypothetical monopolist is lower than the critical value, demand is not so elastic as to restrain the monopolist from increasing price above the current level.

Economic theory dictates that a profit-maximising monopolist will always set its price so that the price-cost margin is equal to the inverse of its own-price elasticity. This is formulated in the following equation, whereby  $P_0$  denotes the prevailing price,  $C$  denotes the cost and  $\varepsilon$  is the own-price elasticity of demand:<sup>108</sup>

$$(4) \quad (P_0 - C) / P_0 = - 1 / \varepsilon$$

Based on this condition, we can derive the critical elasticity formula.<sup>109</sup> Denoting the monopoly price after the price increase as  $P_1$  leads to:

$$(5) \quad \varepsilon = - P_1 / (P_1 - C)$$

106 The price-cost margin is defined as the margin above marginal costs as a proportion of the current price, and is equal to: (Current price – marginal costs) / Current price. Denoting the price cost margin ‘m’, the current price  $P_0$  and the cost  $C$ , yields:  $m = 1 - C/P_0$ .

107 The term was introduced by F.I. Johnson, Market Definition Under the Merger Guidelines: Critical Demand Elasticities, 12 Research in Law and Economics 235 (1989).

108 Pindyck and Rubinfeld (2005), op. cit., at 345.

109 The analysis follows G. J. Werden, Demand Elasticities in Antitrust Analysis, 66 Antitrust Law Journal 363 (1998), at the Appendix; See also J. Church and R. Ware, Industrial Organization: A Strategic Approach, Irwin/McGraw Hill (2000), at 607-609.

What is of interest, is whether the monopoly will set its price more than a proportion 't' above the current price<sup>110</sup> denoted by  $P_0$ , such that the question is what elasticity will lead to the monopolist setting:

$$(6) \quad P_1 = (1 + t) P_0$$

This implies that,

$$(7) \quad \varepsilon = - (1 + t) P_0 / [(1 + t)P_0 - C]$$

Dividing through by  $P_0$  gives:

$$(8) \quad \varepsilon = - (1 + t) / [(1 + t) - C/P_0]$$

In economics, the expression  $1 - C/P_0$  is commonly termed the price-cost margin and denoted by 'm'. Hence, the above equation simplifies to:

$$(9) \quad \varepsilon = - (1 + t)/(m + t)$$

A hypothetical monopolist facing an elasticity of  $-(1 + t)/(m + t)$  will be indifferent to raising the price by 't'. If the elasticity faced by the monopolist is larger in absolute terms than the critical value, the monopolist will raise the price by less than 't'. Likewise, if the elasticity is smaller than the critical value, the monopolist can raise the price by more than 't' and still remain profitable.

To demonstrate, if the difference between price and marginal costs is half of the price (e.g.  $P = 10$  and  $C = 5$ ), and the threshold for a significant price increase is 5%, then 'm' is equal to 0.5, and 't' is 0.05. The critical elasticity of demand would thus be equal to  $-1.9$ . This implies that a profit maximising monopolist will increase price by 5% only if his actual demand elasticity prior to the price increase is lower than 1.9.

For any given demand elasticity and prevailing price, the higher the rate at which the elasticity of demand increases as price is increased, the smaller the price increase a hypothetical profit maximising monopolist would choose to impose. Using demand elasticities therefore requires a preliminary assumption concerning the shape of the demand curve between the pre-merger price and the monopoly price, as this specification will allow comparing between the elasticities at the monopoly and prevailing prices.

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110 't' is the proportionate rise in price, so if our concern is a hypothetical 5% or 10% price rise, 't' is equal to 0.05 or 0.1, respectively.

If, for instance, the demand is assumed to be isoelastic (i.e. the elasticity is constant all along the demand curve), then the critical elasticity of demand at the prevailing price would be equivalent to the elasticity at monopoly price. Consequently, the monopolist would increase price if the actual elasticity at the current level is lower than  $-(1+t)/(m+t)$ .<sup>111</sup> If, on the other hand, the demand curve is assumed to be linear, the elasticity at  $P_0$  will differ from the elasticity at the monopoly price. In this case the critical elasticity can be shown to equal:<sup>112</sup>

$$(10) \quad -1 / (m + 2t)$$

It is important, however, to note that the critical elasticity may provide a reliable rule upon which the profitability of a price increase can be assessed, but it cannot be used on its own. Whilst it provides a yardstick, it does not tell us anything about the actual elasticity which the monopolist will face on the occasion of a price increase. To assess the actual profitability of the price increase, the critical values should be compared with the estimated demand elasticity at the prevailing price, following the econometric estimation procedure outlined above.

#### 4.7.3.3 Cross-Price Elasticity of Demand

Whereas own-price elasticity indicates the sensitivity of consumers' to the product's own price, cross price elasticity focuses on the degree of substitutability between two products, and provides a standard measure for their interchangeability.

To reiterate, cross-price elasticity of demand is defined as the percentage change in the quantity demanded of one product (X) resulting from a one percent increase in the price of another product (Y). Namely, cross-price elasticity of product X with respect to product Y measures the extent to which the volume of sales of X responds to changes in the price of Y.

An estimated value for the cross-price elasticity may either be positive or negative. Positive cross-price elasticity indicates that the products X and Y are substitutes, since an increase in the price of one product increases the demand for the other. For instance, an increase in the price of coffee may positively affect the quantity demanded of tea. On the other hand, a negative value for the cross-price elasticity signifies that the products are complements, since an increase in the price of petrol may decrease the demand for automobiles.

111 Bishop and Walker (2002), *op. cit.*, at 360-361.

112 *Id.* A linear demand curve has the form of  $P = a - bQ$ . The elasticity is equal to  $(\partial Q / \partial P) / (Q / P)$ , which in this case is  $-P / (a - P)$ . Consequently,  $-(1+t) / (m+t) = -P_1 / (a - P_1)$ , or  $(1+t) / (m+t) = (1+t) P_0 / [a - (1+t) P_0]$ . Rearranging gives  $P_0 (m + 2t + 1) = a$ . Since the critical elasticity  $\mathcal{E}$  is equal to  $-P_0 / (a - P_0)$ ,  $a = (-P_0 / \mathcal{E}) + P_0$ , which leads to  $\mathcal{E} = -1 / (m + 2t)$ .

#### 4.7.3.3.1 Potential Pitfalls in the Application of Cross-Price Elasticity

Cross-price elasticity focuses on the competitive pressures between two products, as it measures the change in the demand for one product following a change in the price of another. Hence, between any two different products there will be two different cross-price elasticities, which need not be symmetrical and might differ substantially in magnitude.<sup>113</sup> This poses a problem, since only one of them is directly relevant.

Suppose, for example, that a small increase in the price of X induces very little substitution to product Y, so that a monopolist in product X could increase the price profitably. Suppose also that a small increase in the price of Y induces substantial substitution to product X, so that a monopolist in product Y could not increase its price profitably. In these circumstances, X constitutes its own market, whereas Y does not. Yet, looking at the cross-price elasticity of X with respect to Y (which may be quite large) might erroneously indicate that the two products are in the same relevant market.<sup>114</sup>

Antitrust authorities often invoke cross-price elasticities to determine whether one product is in the same market as another product. A finding of high cross-price elasticity is usually interpreted as indicative that the two products form a single market, since an increase in the price of one of them would induce consumers to shift to the other. A finding of low cross-price elasticity typically suggests that the products do not impose significant competitive constraints on one another, and are hence part of distinct markets.

Such inferences, however, tend to focus on the significance of individual substitutes rather than on the collective competitive significance of all substitutes. That is, in some cases the overall competitive constraints faced by the hypothetical monopolist cannot be captured by one competing seller or product, but rather by the aggregate effect of a number of rivals.<sup>115</sup> For example, even if the cross-price elasticity between beer and wine is calculated to be significant, the market should not necessarily only be comprised of beer and wine, and may be broadened to also include alternative alcoholic drinks which may be perceived by consumers as substitutes should the price of beer increase.

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113 Consider, for example, that a decline in the price of wheat may devastate the market for rye, but a decline in the price of rye may hardly be noticeable in the much bigger wheat market. See Lexecon (1999), *op. cit.*, at 27.

114 Werden (1998), *op. cit.*, at 402; Bishop and Walker (2002), *op. cit.*, at 49. An example for confusing the two elasticities can be found in Case IV/M.430 Procter & Gamble/VP Schickedanz, (1994) OJ L 354/32, at para. 54. The parties argued that the sales of their Always brand of sanitary towels was influenced by the price of o.b. tampons, and that they were therefore in the same product market. Yet the data reflected changes in the sales of o.b. following changes in the price of Always. This is the opposite cross-price elasticity, since it provides an estimate of the constraining effect of Always on o.b. rather than the other way around.

115 Werden (1998), *op. cit.*, at 402.

Alternatively, concluding that beer is in a separate market, since the calculated cross-price elasticity between beer and wine is low, may also be refutable.<sup>116</sup>

Hence, a comprehensive market definition exercise must incorporate a product-by-product analysis of all potentially relevant cross-price elasticities, a task which is at best difficult, and which might render cross-price elasticity an inadequate tool for the delineation of markets. Moreover, since the own-price elasticity for a product is the weighted average of all the cross-price elasticities of demand for that product, it is possible for all the relevant cross-price elasticities to be low, but for the own-price elasticity still to be high. As a result, undertaking the market definition exercise via the estimation of cross-price elasticities can be demanding, and even misleading, if all the potential substitutes are not accounted for.

Furthermore, the use of cross-price elasticity for market definition analyses is especially problematic in monopolisation cases, as opposed to mergers, due to the existence of the notorious ‘cellophane fallacy’.<sup>117</sup> In monopolisation disputes, a high value for the cross-price elasticity might erroneously indicate a high degree of interchangeability, where no real closeness of substitutes actually exists.<sup>118</sup>

Most importantly, cross-price elasticity does not directly address the market definition question – as formulated in the 1997 Notice and the U.S. Merger Guidelines<sup>119</sup> – as it does not indicate how much substitution is enough to constrain the profitability of a SSNIP. In contrast to the own-elasticity of demand, which directly reveals whether a given group of products and areas constitute an antitrust market, cross-price elasticity can only measure one direction for the flow of demand as the price of a good increases, merely suggesting that one given product is likely to be in the same market with another. When evidence indicates positive and high

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116 It is possible for a particular cross-price elasticity to be low, but for the own-price elasticity to be high, as the latter encompasses all competitive constraints, while the former focuses only on a single pair of products.

117 Named after *United States v. E.I. DuPont de Nemours & Co.*, 351 U.S. 377 (1956). The full merits of the fallacy are elaborated in Chapter 3.

118 H. Hovenkamp, *Federal Antitrust Policy*, West (2005), at 104-106; R.A. Posner and F.H. Easterbrook, *Antitrust: Cases, Economic Notes and other Materials*, West (2<sup>nd</sup> ed., 1981), at 360-362; L.A. Sullivan, *Handbook of the Law of Antitrust*, West (1977), at 53-58; Werden (1998), *op. cit.*, at 377; R.J. Van den Bergh and P.D. Camesasca, *European Competition Law and Economics, A Comparative Perspective*, Sweet & Maxwell (2<sup>nd</sup> ed., 2006), at 130. The issue is addressed in detail in Chapter 3.

119 U.S. Department of Justice and the Federal Trade Commission *Horizontal Merger Guidelines*, 57 Fed. Reg. 41552, reprinted in 4 Trade Reg. Rep. (CCH), 104 (1992, revised April 1997) (hereinafter: “U.S. Merger Guidelines”).

cross-price elasticity between products, it is natural to expect that the two products would belong to the same relevant market. Yet, it is difficult to translate the magnitude of the cross-price elasticity into a concrete conclusion concerning specific market boundaries, or to make inferences regarding the market power of the firm, at which the market delineation procedure is aimed.<sup>120</sup> Hence, while cross-price elasticity can provide a measure of interchangeability, ranking of substitutes, and information relevant to assessing whether a proposed market definition is or is not reasonable, it does not in itself provide a market definition.<sup>121</sup>

#### **4.7.3.4 Additional Subtleties in the Application of Demand Elasticities**

##### **4.7.3.4.1 The Appropriate Time Interval for Measuring Demand Elasticities**

Since elasticity measures the response of consumers to a price increase, the immediate response might differ from the long-term response. Therefore, when using elasticities estimations it is important to consider which elasticities to use. In general, it is recommended to measure the response over one to two years.<sup>122</sup>

An additional concern is to account for the frequency of the observations upon which the analysis is based. When scanner data is available, it may provide multiple observations separated by a short time period. Frequent sampling raises the issue of the appropriate time interval for measuring demand elasticities. For instance, data collected over three years can offer three yearly observations or 12 quarterly observations, both too few to permit a statistical analysis. However, it could also provide 36 monthly observations or 156 weekly observations.<sup>123</sup>

A potential problem with using weekly demand data may arise when short-term price promotions are employed by the seller. Manufacturers of branded products tend to offer such promotions several times during the year, allowing consumers to hold inventories and to stock-up when prices are temporarily reduced, whilst otherwise holding purchases when prices are high. These very short-run elasticities may be misleading, and may not guide a correct as-

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120 Werden (1998), *op. cit.* at 401-402.

121 *Id.*, at 403. Competition authorities, however, tend to invoke the cross-price elasticity concept, and to place great weight on such evidence. See for example *New York v. Kraft General Foods, Inc.*, 926 F. Supp. 321 (S.D.N.Y. 1995). Notably, when markets are highly differentiated, cross-price elasticity may become useful, because building up a market definition in the traditional manner is inherently complex, and cross-price elasticity can assist in determining an appropriate chain of substitution. See Rubinfeld (2000), *op. cit.*, at 178.

122 Bishop and Walker (2002), *op. cit.* at 361

123 J.B. Baker, *Product Differentiation: Contemporary Merger Analysis*, 5 *George Mason Law Review* 347, 352 (1997).



assessment of the competitive structure of the market and the possible effects of the transaction.<sup>124</sup>

#### 4.7.3.4.2 Problems with Measuring Price-Cost Margins

Price-cost margins are fundamental to the determination of the critical elasticity of demand and the critical sales loss, elaborated below. The importance of such margins is, however, unsettled by the difficulties in the measurement of marginal costs. Often, marginal costs cannot be measured at all, and are typically proxied by average variable costs.<sup>125</sup> Still, there can be significant difficulties in determining the average variable costs. First, it is sometimes ambiguous which costs should be treated as fixed and which should be treated as variable.<sup>126</sup> Additionally, measures of average variable costs that exclude expenditures on advertising and other promotions may underestimate marginal costs, and thus suggest a misguided conclusion concerning the interpretation of the elasticity of demand.<sup>127</sup>

Second, it is important to acknowledge that the measurement of a price-cost margin is sensitive to the choice of the incremental unit of output. For example, airline margins are very high if the incremental unit of output is an additional passenger on a plane that is not full, but they are drastically lower if the incremental unit is taken to be an additional flight per day.<sup>128</sup>

#### 4.7.3.4.3 The Reverse Cellophane Fallacy

Under the SSNIP paradigm, a candidate market is considered an antitrust market if the optimal (profit maximising) monopoly price increase above the prevailing level exceeds the 5-10% significance threshold. The profit maximisation condition involves the elasticity of demand at the monopoly price, but this monopoly is only hypothetical, so it is not possible to directly measure the demand elasticity at the monopoly price. Instead, the critical elasticity of demand is defined at pre-merger prices. Implicit in this analysis is the assumption of constant elasticity, namely that own-price elasticity of demand for a product is the same whatever the price is.<sup>129</sup> However, it is by no means clear that elasticities are always constant, and it is often believed that the elasticity of demand at the monopoly price exceeds the value of the elasticity at the current price. Ignoring

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124 Id, 353-354.

125 This is the common practice when marginal costs are assumed to be roughly constant, which commonly is the case. See Werden and Froeb (1993), *op. cit.* at 331; Werden (1998), *op. cit.*, at 394. Compare, however, with M.G. Baumann and P.E. Godek, *A New Look at Critical Elasticity*, 51 *Antitrust Bulletin* 325 (2006).

126 P.E. Areeda, H. Hovenkamp and J.L. Solow, 2A *Antitrust Law*, Little (1995), at 96-100.

127 Baker (1997), *op. cit.*, at 358.

128 Werden (1998), *op. cit.*, at 394.

129 This is an assumption ordinarily made in econometric analysis. See Bishop and Walker (2002), *op. cit.* at 359.

this fact can cause an over estimation of the degree of market power, giving rise to a *reverse cellophane fallacy*, and leading to markets that are defined too narrowly.<sup>130</sup>

#### **4.7.3.4.4 Further Adjustments to the Analysis**

There are several circumstances in which the analysis would have to be modified to insure accuracy. First, when the firm produces more than just one product, a reduction in sales of one product may allow the firm to produce and sell more of the other product. In this case, the computation has to account both for the lost revenue from the decreased sales of the first product, and the increase in revenue generated by the extra sales of the second.<sup>131</sup>

Second and along similar lines, adjustments are required if the firm sells products that are production complements, so that the reduction in sales of one product forces the firm to produce less of the complement product too. In that case, the analysis will have to include the foregone profit from the additional sales loss.<sup>132</sup>

Third, the analysis has to consider strategic decisions by the firm, such as in the case of price discrimination, when the firm is able to reduce sales to one group while compensating by selling more to another group. In such situations, alternative critical elasticity and sales loss formulae must be derived, based on the particularities underpinning the industry.<sup>133</sup>

Fourth, the standard calculations may not be useful in situations where neither a linear nor isoelastic demand curve is appropriate. When the demand curve is kinked in either way, the issue is how much price can be increased before the kink is reached, and the calculated critical values are to no avail.<sup>134</sup>

#### **4.7.4 The Use of Demand Elasticities in Competition Law Analysis**

The following cases demonstrate how demand elasticities can offer valuable insights into the market definition assessment. Estimated elasticities may be utilised to affirm or dismiss a prospective market suggested by the parties to the case, to eliminate implausible definitions and to support the choice between alternative possible candidate markets.

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130 Id., at 360; Werden (1998), op. cit., at 388.

131 LECG (1999), op. cit., at 80.

132 Id..

133 Werden (1998), op. cit., at 393.

134 Id., at 392-393.

***Kimberly-Clark/Scott***<sup>135</sup>

Kimberly-Clark (KC) and Scott were leading American manufacturers of tissue products with substantial operation in Europe, who notified of their intended merger in 1995. KC was a main supplier of a wide range of paper products for personal, business and industrial uses, including a variety of consumer products such as disposable baby nappies, adult incontinence, feminine protection and sanitary tissue. Scott was primarily active in the manufacture and sales of tissue products for personal care, environmental cleaning and wiping, health care and food services. Following the merger, the two companies were expected to form the world largest manufacturer of tissue products.

The main interest in the investigation was the provision of bath tissue products. At the time of the merger KC had introduced its Kleenex Bath Tissue premium product into certain areas of the U.S., whereas Scott was offering two bath tissue products, the premium brand Cottonelle and the economy brand ScotTissue. Within the market for bath tissue, Kleenex had a 7.5% pre-merger market share, Cottonelle 6.7% and ScotTissue 16.7%.<sup>136</sup> The dominant brand in that market was the premium brand Charmin, produced by the competitor Procter & Gamble, and holding 30.9% of the market. Other recognisable premium brands were Northern (12.4%) and Angel Soft (8.8%). Economy bath tissue market shares were 16.7% for ScotTissue, 7.6% for private label tissue and 9.4% for all smaller brands combined.

The pertinent question in this case was whether the merged entity could raise the prices of Kleenex Bath Tissue, Cottonelle and ScotTissue, unilaterally. Considering the market share figures presented above, a Kimberly-Clark/Scott merger would presumably increase concentration in an already highly concentrated environment, allowing the firms a greater degree of market power, and enabling it to act independently of its competitors to increase prices.

In the case at hand, econometric analysis of the demand for the merging firms' products allowed better insights into the likely effects of the merger. The data comprised a weekly Nielsen supermarket scanner data collected in five U.S. cities over a period of 41 months, and enabled a direct estimation of the demand structure for bath tissue, as presented in the following table:<sup>137</sup>

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135 USA v. Kimberly-Clark and Scott Paper, Civil Action No. 3-95CV3055-P (D.C. Texas 1995). See the discussion of the case in J.A. Hausman and G.K. Leonard, *Economic Analysis of Differentiated Products Mergers Using Real World Data*, 5 *George Mason Law Review* 321 (1997), at 335-336. The EU Kimberly-Clark case is further discussed in Chapter 5.

136 Hausman and Leonard (1997), *op. cit.*, at 344.

137 *Id.*, at 345.

**Table 5.** Bath Tissue Demand Elasticities

	<b>Kleenex</b>	<b>Charmin</b>	<b>Cottonelle</b>	<b>Northern</b>	<b>Angel Soft</b>	<b>ScotTissue</b>	<b>Private Label</b>	<b>Other</b>
Kleenex	-3.375	0.686	0.191	0.214	0.129	0.178	0.033	0.510
Charmin	0.066	-2.746	0.039	0.023	0.036	0.108	-0.222	0.090
Cottonelle	0.135	0.269	-4.517	0.810	0.512	0.224	0.051	0.013
Northern	0.041	0.112	0.429	-4.211	0.550	0.410	0.121	-0.063
Angel Soft	0.019	0.171	0.380	0.772	-4.077	0.075	0.168	-0.153
ScotTissue	0.061	0.536	0.143	0.417	0.123	-2.943	0.077	-0.109
Private Label	0.124	-0.112	0.198	0.494	0.409	0.417	-2.024	0.272
Other	0.462	0.341	0.128	0.152	0.026	-0.031	0.181	-1.980

The table depicts demand elasticities among the varying brands of bath tissue, both own price and cross-price. The light-shaded cells provide the own-price elasticity estimates for each one of the merged entity's tissue brands. Kleenex's own price elasticity was estimated to be around -3.4, which implies that a 10% price increase in the price of Kleenex would result in a 34% decrease in its sales. Moreover, Kleenex's highest cross-price elasticity was with Charmin (0.69), which suggested that the competition between Charmin and Kleenex was the closest. The next-best substitutes for Kleenex according to the elasticity estimates were the premium tissue products Northern (0.21) and Cottonelle (0.19) (dark-shaded first-row cells).

Likewise, Cottonelle's own-price elasticity was high and equal to -4.5. The cross price elasticity of Cottonelle with respect to the price of Northern was highest (0.81), followed by Angel Soft (0.51).

The economy tissue ScotTissue was estimated to have an own-price elasticity of demand equal to -2.9. Further, the closest substitutes were Charmin (0.54) and Northern (0.42).

From these results, it was possible to infer the existence of two separate market segments: premium and economy. The high own-price elasticity of Kleenex, combined with the fact that its three largest cross-price elasticities were with other premium brands, was consistent with the notion of a premium bath tissue market. Cottonelle's elasticity figures supported such a conclusion, because it too faced high own-price elasticity and competed with the premium brands Northern and Angel Soft. At the same time, whilst ScotTissue was perceived by consumers as a viable substitute for Charmin and Northern in the event of their price increase, only a small fraction of consumers were shown to switch from ScotTissue to premium brands in case of the former's price rise, therefore implying a separation of the premium and economy markets. As KC was only active in the premium segment, and Scott was present both in the premium and economy segments, a merger between them would not necessarily lead to an anti-competitive outcome.

Moreover, the calculation of demand elasticities in this case provided important insights into the likely effect of the merger on competition. Using the estimated demand structure, it became possible to predict the prospective changes in the products' prices post-merger. Assuming that the merger would not result in marginal cost reductions, the prices of Kleenex, Cottonelle and ScotTissue were estimated to rise by 2.4%, 1.4% and 1.2%, respectively. If, on the other hand, the merger would induce marginal cost savings, the expected price changes would be even lower: 0.4% change in the price of Kleenex, -0.3% in the price of Cottonelle, and -1.8% in the price of ScotTissue. Such figures suggested that the

merger would not strengthen the parties' market power, and ultimately served to clear the transaction.

***Procter & Gamble/VP Schickedanz***<sup>138</sup>

As mentioned earlier, the parties to the merger were involved in the production of household paper products and sanitary protection products in several European countries. The case centred on the feminine hygiene market, in particular with respect to sanitary towels. In this market Schickedanz produced the Camelia brand and Procter & Gamble produced the leading Always brand.

A key issue in the investigation was whether tampons and sanitary towels should be included in the same relevant market. In order to establish that the sales of towels were significantly influenced by the price level of tampons (and that they were therefore in the same product market) P&G provided scanner data from several sources, which established a high own price elasticity for Always sanitary towels, as well as the existence of cross-price elasticity between towels and o.b. tampons.

However, the Commission dismissed this evidence, based on the fact that the elasticity calculations submitted by P&G were solely based on weeks when the price of Always was reduced. As such, the analysis comprised of a rather limited number of observations, and more fundamentally, it could serve to explain many irrelevant variations in the sales of Always following a change in its price, for instance, seasonal variations or promotions in other stores beside the scope of the scanner sample, other than variations resulting from competition between towels and tampons alone.

In order to distinguish the various effects of different explanatory variables (price variations being just one among other possibilities that may explain change in sales), and to exclude promotional elasticities, the Commission utilised a Nielsen model provided by the parties' competitor Johnson & Johnson. The study assessed whether Always Super Thin towels competed closely with o.b. tampons, and showed that neither o.b. promotions nor its long-term price development had had any significant impact on the sales of Always.

The results of the Nielsen model were further confirmed by a separate analysis made by the American RLS company, which established that the own-price elasticity of sanitary towels was  $-0.5$ , and that the cross price elasticity of pads with respect to o.b. tampons was  $0.3$ . Such low figures for demand elasticities supported the Commission's view that substitution between the products was low and not motivated by price fluctuations, and hence implied that the sanitary towels and tampons constituted separate relevant product markets.<sup>139</sup>

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138 Case IV/M.430 Procter & Gamble/VP Schickedanz, (1994) OJ L 354/32.

139 It should be noted that the Commission made use of the RLS study, which was based on U.S. (rather than EU) scanner data. Yet, it was effectively assumed by the Commission that consumers' switching

***Bumble Bee/Connor Brands***<sup>140</sup>

A final illustration for the potential contributions of demand analysis and the elasticity concept in market definition investigations can be found in the recent merger between Bumble Bee and Connor, two sardine manufacturers. Bumble Bee produced sardines under its own brand name, and distributed a Norwegian brand, King Oscar, in the U.S. Connor produced and sold a number of sardine brands, most notably Brunswick, Beach Cliff, and Port Clyde.

Bumble Bee's own brand product and the three Brands produced by Connor all fell within the 'mainstream' (distinguished from 'premium' or 'ethnic') sardines category, as regards their price and product qualities. In this market segment, Bumble Bee enjoyed a 13% market share and Connor 63%, indicating that the merger would lead to a highly concentrated competitive environment. Bumble Bee's King Oscar, however, was a premium product. This raised obvious questions in relation to the definition of the relevant market: if mainstream sardines formed a market separate from premium sardines, competitive concerns would only be confined to the former market, because Connor was not selling any premium products. If, on the other hand, mainstream and premium sardines were in the same market, any divestiture remedy advanced by the Department of Justice would also have had to include King Oscar.

In order to highlight the competitive relations between the different segments of the market the parties' economists, together with economists retained by the DOJ, estimated the own-price elasticity of demand for mainstream and premium sardines using scanner data, which included weekly price and quantity observations from several U.S. cities along a two-year period. The foregoing econometric analysis revealed that for both segments, the estimated elasticities were approximately -1. Such a result should be interpreted as indicative of two separate relevant markets. If either mainstream or premium sardines producers would raise the price by 10%, they would incur a 10% fall in sardines sales, likely rendering the price increase unprofitable. Own-price elasticity findings were therefore useful in establishing market boundaries, and allowed the DOJ to focus the discussion and concentrate on the mainstream market for sardines only, in which the merger would have increased the already significant level of concentration.

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behaviour and key market characteristics were, under the circumstances, similar for the U.S. and the German (relevant geographic) market.

140 USA v. Connors Bros. Income Fund and Bumble Bee Seafood, Civil Action No. 1:04CV01494 (August 31, 2004). See also the DOJ Press Release (August 31, 2004) and the case discussion in C. Dippon, G. Leonard and L. Wu, NERA Economic Consulting, Application of Empirical Methods in Merger Analysis (June 27, 2005), at 114-118.

## 4.8 Critical Loss Analysis

As elaborated above, it is the elasticity of demand that determines how many consumers will substitute the product following its price increase, and how many will continue their purchases despite the higher price. In considering demand elasticities, the crucial turning point for rendering a price rise profitable is determined by the critical elasticity. A further closely associated mode of analyses considers the firm's loss of sales resulting from the increase in price. In particular, corresponding to any critical elasticity of demand is a *critical sales loss*, a term which refers to the maximum loss in unit sales the hypothetical monopolist would be able to suffer and still raise the price by the SSNIP threshold amount.<sup>141</sup> Critical loss analysis addresses the following simple question: what amount of sales would have to be lost to make a hypothetical price increase unprofitable?<sup>142</sup> If the actual loss is less than the critical loss, the price increase would pay off. Otherwise, it would not and the proposed market definition would have to be broadened.

Implementing the critical loss methodology involves 3 steps of analysis:

- (1) Estimating the hypothetical monopolist's price-cost margin before the price increase.

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141 The use of critical loss analysis was first advanced by B.C. Harris and J.J. Simons, *Focusing Market Definition: How Much Substitution Is Necessary?*, 12 *Research in Law and Economics* 207 (1989).

142 There seems to be a debate about what it actually means for the hypothetical monopolist to find it profitable to raise prices by a small but significant amount. As a result two critical loss concepts can be encountered. The natural understanding (which is also more consistent with the U.S. Merger Guidelines) is that a monopolist would do so if this would maximise profits. An alternative approach is to ask whether the monopoly profits can increase as a result of the price increase, compared to their current level. It might be the case for example that a hypothetical monopolist would maximise profits by increasing prices by four percent, but a six percent price increase would still make higher profits than if prices were left at their current level. The critical loss calculations presented here follow the most prominent articles written in this field, by addressing the question whether a particular SSNIP, not necessarily a profit-maximising one, yields higher profit than the pre-merger price. A rough approximation (exact for linear demand) is that the profit-maximising price increase is half as much as the price increase that leaves profits unchanged. For example, if a 5% price increase maximises profits, a 10% increase will allow the firm to break even. See D. P. O'Brien and A.L. Wickelgren, *A Critical Analysis of Critical Loss Analysis*, 71 *Antitrust Law Journal* 161 (2003), at footnote 11. The most significant reason to favour the break-even formula rather than the profit-maximizing one is that break-even critical loss does not depend on the assumed curvature of demand. See Werden (1998), *op. cit.*, at 389; M.G. Baumann and P.E. Godek, *Could and Would Understood: Critical Elasticities and the Merger Guidelines*, 40 *Antitrust Bulletin* 885 (1995); J. Langenfeld and W. Li, *Critical Loss Analysis in Evaluating Mergers*, 46 *Antitrust Bulletin* 299, 304 (2001); Bishop and Walker (2002), *op. cit.*, at 360. In addition, break-even critical loss can be a good approximation of profit-maximizing critical loss under a relatively small price increases and high margins. See Werden (1998), *op. cit.*, at 390.



- (2) Determining the critical percentage of customers the hypothetical monopolist could lose before the price increase becomes unprofitable.
- (3) Estimating whether this hypothetical monopolist would actually lose this percentage of customers if it increased price. An actual sales loss greater than the critical value would therefore imply that the monopolist is expected to increase price by less than the SSNIP.

The first and third steps rely on data from the particular case examined, while the second step – based on data from step one – is purely mathematical, and is thereby discussed first.

#### 4.8.1 Calculating the Critical Loss

Calculating the critical loss requires balancing two effects: (1) A given price increase raises the profit margin earned on all units that are sold, but (2) it also reduces the quantity demanded and results in fewer units being sold. The critical loss is the percentage reduction in quantity that balances these two effects.

The benefits of the price increase can be described as  $\Delta P (Q + \Delta Q)$  (i.e. the change in price multiplied by the quantity that will be sold at the new price), whereas the costs of the price increase are  $-(P - C) \Delta Q$  (the pre-merger price-cost margin times the quantity reduction caused by the price increase). As a result, a hypothetical monopolist is indifferent to a price increase if:<sup>143</sup>

$$(11) \quad \Delta P (Q + \Delta Q) = -(P - C) \Delta Q.$$

Dividing both sides of the equation by  $PQ$  gives:

$$(12) \quad (\Delta P/P) (1 + \Delta Q/Q) = -[(P - C)/P] (\Delta Q/Q).$$

Solving for the critical loss -  $\Delta Q/Q$  (the percentage reduction in quantity) gives:

$$(13) \quad \Delta Q/Q = (\Delta P/P) / (\Delta P/P + m)$$

In these equations, 'm' is the price cost margin measured as a percentage of the price, and  $\Delta P/P$  is the percentage price increase, hereinafter denoted by 't'.<sup>144</sup>

143 In the following calculations, unit costs  $C$  are variable costs. Because fixed costs do not vary with output, the firm will not consider them in deciding whether changing the quantity is profitable.

Since marginal (per-unit) costs are often difficult to measure, a common practice is to proxy it by average variable costs, as long as costs are assumed to be roughly constant. If costs per unit fall as sales decline, the critical loss value would have to be lower.

144 So for a 5% price increase 't' is equal to 0.05.

The critical loss condition can be therefore written as:

$$(14) \quad t / (m + t)^{145}$$

The following table illustrates how critical loss values change for various price increases and initial price-cost margins:

**Table 6.** Critical Loss Calculations for Different Margins and Price Rises

Initial Margin	Price Increase			
	5%	10%	15%	20%
0.1	0.33	0.5	0.6	0.67
0.2	0.2	0.33	0.43	0.5
0.3	0.14	0.25	0.33	0.4
0.4	0.11	0.20	0.27	0.33
0.5	0.09	0.17	0.23	0.29
0.6	0.08	0.14	0.20	0.25
0.7	0.07	0.13	0.18	0.22
0.8	0.06	0.11	0.16	0.2
0.9	0.05	0.10	0.14	0.18

If the pre-merger margin is 60%, the critical sales loss following a 5% price increase will be about eight percent. Intuitively, the larger the margin, the greater the profit lost from a given reduction in quantity, so the smaller the reduction in quantity (i.e. the critical loss) required for a given price increase to be unprofitable. If the price-cost margin is quite high (e.g. 80%-100%), a loss in sales of only about 5% would be sufficient to deter the hypothetical monopolist from increasing price by 5%. If the margin is quite low (e.g. less than 20%), a loss in sales of more than 20% would be necessary to dissuade the monopolist from increasing price by 5%.<sup>146</sup>

#### 4.8.2 Estimating the Price-Cost Margin

The first step of the analysis is to calculate the gross margin 'm' (also known as the Lerner Index). That is, the percentage difference between the price the

145 Werden (1998), op. cit., calculate the same formula at 410-412.

146 G.J. Werden, Four Suggestions on Market Delineation, 37 Antitrust Bulletin 107, 116 (1992),.

hypothetical monopolist charges for the last unit sold and the incremental (marginal) cost of producing that unit. For example, if the price is €100 and the cost of producing the last unit is €40, the price-cost margin would equal  $(100 - 40)/100 = 0.60 = 60\%$ .<sup>147</sup>

The price-cost margin is routinely calibrated from accounting data reflecting the industry under investigation.<sup>148</sup> This includes identifying all components of the firm's costs that vary with output. Additionally, it is important to determine whether marginal costs rise with output rather than remain constant, in which case the critical loss calculation will have to be modified. Once the value of 'm' is known, this value must be substituted into the formula and critical loss can be calculated.<sup>149</sup>

#### 4.8.3 Estimating the Actual Sales Loss

The final part of the analysis seeks to quantify how many consumers would actually switch on the occasion of a price increase. To estimate the forgone sales sustained by the monopolist, it is necessary to predict the likely reactions of competing producers of the same product, producers producing alternative products, and consumers. This information can be obtained using one of the following ways.

First, it is possible to derive the *critical demand elasticity* associated with the critical loss,<sup>150</sup> computed by dividing the critical loss by the assumed increase in price,<sup>151</sup> and to compare it with an estimation of the *actual demand elasticity*, as previously discussed. If the actual elasticity is larger than the critical value, the sales loss will be larger than the critical loss, and the price increase unprofitable.<sup>152</sup>

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147 As a matter of arithmetic, the price-cost margin must fall between zero and 100%. A margin of zero means that the price equals the marginal cost as in a perfect competition, while a margin approaching 100% implies that the marginal cost is only a small fraction of the price. In industries with high-fixed costs (e.g. software or pharmaceuticals) or with highly differentiated products price-cost margins are often around the 50% or even larger. See M.L. Katz and C. Shapiro, *Critical Loss: Let's Tell the Whole Story*, *Antitrust Magazine* (Spring 2003), at 50.

148 G.J. Werden and L.M. Froeb, *Calibrated Economic Models Add Focus, Accuracy, and Persuasiveness to Merger Analysis* (2002), available at [www.cea.fi/course/material/calibrated.pdf](http://www.cea.fi/course/material/calibrated.pdf); Langenfeld and Li (2001), *op. cit.*, at 306-307.

149 Naturally, the determination of 'm' for the sake of critical loss analysis suffers from the same difficulties mentioned above with reference to the critical elasticity.

150 Harris and Simons (1989), *op. cit.*, at 217.

151 For example, the critical elasticity formula in its simplest form is  $1/(m + t)$ , relying on the same variables "m" and "t" needed to calculate critical loss. See Church Ware (2000), *op. cit.*, at 609; Werden (1998), *op. cit.*, at 410-412.

152 Yet, as elaborated above, estimation of the actual demand elasticity is often difficult due to its extensive data requirements, and so under many circumstances is impractical.

Another possibility, and by far the more prevalent one, is to use qualitative evidence showing that buyers shifted or considered shifting their purchases to alternative products or locations in response to a price increase. Such evidence can be obtained from surveys of market participants and third-party sources. Alternatively, evidence about buyers' costs associated with switching products or buying in more distant locations may serve to estimate the actual loss. In some cases, past sales and historical price data can provide natural experiments for revealing buyers' responses to a change in the relative price.

#### **4.8.4 Focusing Critical Loss: Advantages versus Potential Pitfalls**

The straightforward intuition behind critical loss and its fairly simple application are probably the reasons why it has gained popularity in U.S. competition law proceedings. Moreover, critical loss analysis is informative in places where other techniques fail. One such case is where the demand function is kinked. With a kinked demand curve, it is possible, for example, that demand is relatively insensitive to a price increase, until a certain level is reached at which consumers switch to other products or locations in large numbers.<sup>153</sup> This occurs when consumers on the 'margin' remain indifferent to the price increase until it becomes substantial in magnitude. This type of demand curve would result in small price increases being profitable, while large price increases would not. In this case, the key issue is how much the price can be increased before the kink is reached. Whereas critical elasticity estimations, for instance, would be of no avail in these circumstances, critical sales loss would still be valid, since it is independent of the functional form of demand.<sup>154</sup> As long as there is evidence with regards the proportion of price-sensitive consumers that would offset a price increase, critical loss remains workable. On the other hand, there are occasions when a simplistic use of the standard critical loss formula would be mistaken, and would lead to an erroneous delineation of a market. Practitioners of critical loss analysis should therefore be wary of the following potential pitfalls.

First, an argument commonly raised by the parties in market definition inquiries is that high margins, implying a small critical loss, support a finding of a broad antitrust market. The parties frequently assert that since their price-cost margins are high, it will take fewer lost sales to offset the profitability gains associated with any given price increase. They contend thus, that if prices were raised by 5%, the actual loss would very likely be greater than the critical loss, thus rendering the price increase unprofitable and calling for a broader delineation of the market.

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153 The opposite can also occur, depending on the nature of consumer demand.

154 Werden (1998), *op. cit.*, at 392-393; Langenfeld and Li (2001), *op. cit.*, at 311-312.

This story is, however, incomplete. That high margins are associated with small critical loss can be deduced from the critical loss equations presented above, but high margins imply in fact a small actual loss. This results from the fact that a firm can only earn high margins if it already has some degree of market power. The inverse relationship between high margins and inelastic demand is a matter of elementary microeconomics,<sup>155</sup> and high margins typically suggest that consumers are not very price sensitive (otherwise, the firm could cut prices and increase output, which would imply – contrary to the assumption underlying all competition law analyses – that the current price level is not profit-maximising). Arguing, therefore, that large numbers of sales would be lost following a price increase is inconsistent with large margins, and this sensitivity of critical loss to existing market power must not be overlooked by competition authorities<sup>156</sup>.

Second, standard critical loss analysis commonly ignores the degree of substitutability among the products of the firms considering the price increase. The greater the cross-price elasticities between those products, the more the firms will profit from increasing the price of a product, since the lost sales from one product will be captured by its substitutes. Furthermore, competition authorities employing critical loss analysis should recognise that the central question of market definition is how price-induced changes would affect the profits of the *hypothetical monopolist*, which is different from asking how a price increase would affect the profits of one of the competing firms. In many instances the hypothetical monopolist controls multiple products in the candidate market, and as a result would be less sensitive to a price increase than a single firm; unlike a single firm, it will not lose sales competing with itself.<sup>157</sup> Failing to incorporate the effects of substitution between products under the hypothetical monopolist's control into the analysis will lead to an overestimation of the actual loss and to a market too broadly defined, since whereas the single firm might be worse off after the price increase, the monopolist as a whole might be profitable.<sup>158</sup>

Finally, economists usually assume that demand curves are smooth rather than kinked. A kinked demand curve poses an additional challenge, requiring caution in applying the critical loss, since the analysis must be able to distinguish small

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155 In particular,  $m = 1/\mathcal{E}$ , where 'm' is the price-cost margin, and  $\mathcal{E}$  is the elasticity of demand. See Pindyck and Rubinfeld (2005), op. cit., at 345.

156 K.L. Danger K.L. and H.I. Frech , Critical Thinking about "Critical Loss" in Antitrust, 46 Antitrust Bulletin 339 (2001), at 347-349; Langenfeld and Li (2001), op. cit., at 308-309; Katz and Shapiro (2003), op. cit., at 50-51; O'Brien and Wickelgren (2003), op. cit., at 162.

157 Katz and Shapiro (2003), op. cit., at 51; O'Brien and Wickelgren, (2003), op. cit., at 162.

158 As happened in the case of *FTC v. Tenet Health Corp.*, 186 F. 3d 1045 (8<sup>th</sup> Circuit 1999), discussed below.

price increases from greater ones. Sometimes, whereas a small price increase can be unprofitable, a large price increase may prove to be profitable. A firm can have a small group of price-sensitive consumers, and a more substantial group of inelastic consumers. A small price increase would lead most of the price-sensitive consumers to migrate to substitute products, but a larger price increase would lead very few of the relatively insensitive consumers to switch. As a result, a large price increase is profitable, whilst a small price increase is not. Failing to recognise this, and narrowly focusing on a critical loss analysis of a 5% price increase, might overestimate the size of the antitrust market.<sup>159</sup>

#### **4.8.5 The Use of Critical Loss in Competition Law Analysis**

##### ***FTC v. Tenet Healthcare***<sup>160</sup>

To best understand how critical loss is employed in competition law cases, it is useful to examine how it has played out in the courts. A good illustration is found in *FTC v. Tenet*, one among several hospital mergers that took place in the U.S. recently. The case concerned a proposed merger between the only two commercial hospitals in the region of Poplar Bluff, Missouri. The merger was sought to lessen competition for primary and secondary inpatient hospitalisation services in the area, raising competitive concerns mainly revolving around the relevant geographic market.

Based on the undisputed finding that the two hospitals drew 90% of their patients from the Poplar Bluff and its 50 miles radius surroundings, the Federal Trade Commission contended that the relevant geographic market corresponded to this service area. According to the FTC market definition, the defendants would have gained a post-merger market share of 84%, which would have allowed them to raise prices significantly. The defendants, on the other hand, asserted that the relevant geographic market was much broader and actually consisted of a 65 air miles radius encircling Poplar Bluff, including additional regional hospitals which were not considered by the FTC.

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159 Such an error was recently made by a U.S. court in a hospitals merger case: *California v. Sutter Health System*, 84 F. Supp. 2d 1057 (N. D. Cal. 2000). The court accepted the defendants' argument that a 5% increase would not have been profitable, since their actual loss would exceed the critical loss. The court dismissed evidence showing that price increases far greater than 5% **would** have been profitable, although a 5% increase was not. Likewise, the court ignored the fact that under a large price increases critical loss analysis indicated that actual loss did not exceed the critical loss, and supported a narrower definition of the market. The court held that only the 5% threshold was relevant, and on this basis defined the relevant geographic market too broadly. For elaboration on the economic analysis behind this case see Werden (2002), *op. cit.*

160 *FTC v. Tenet Healthcare Corp.*, 17 F. Supp. 2d 937 (E.D. Missouri, July 30, 1998), and *FTC v. Tenet Healthcare Corp.*, 186 F.3d 1045 (8<sup>th</sup> Circuit 1999).

To support their proposition that the merged entity would not be able to profitably raise prices after the merger, the defendants made use of critical loss analysis. In particular, they provided accounting information to conclude that the merged hospital would have a price-cost margin of about 65.9%, implying that a critical loss of 7.1% was needed to render a 5% price increase unprofitable.

As with other cases, the key question was posed by the magnitude of the actual loss. The defendants advocated an actual loss greater than 7.1%, whilst the FTC claimed that the percentage of lost patients would not exceed this figure.

Relevant data for assessing actual loss in this case included both statistical and anecdotal evidence. The FTC brought statements by Poplar Bluff managed care organisations and employers, who testified that they would not steer patients to hospitals outside the region in response to a small price increase. Similarly, hospital administrators outside the proposed geographic market testified that they would not expect any increase in patient admissions if the Poplar Bluff hospitals were to merge and raise prices.

In contrast, the defendants' economic expert made extensive inquiries into patients' residential zip codes, to show that many people in Poplar Bluff already sought medical treatment at hospitals outside the region for services that were available in Poplar Bluff, thus concluding a sufficient actual loss to defeat a price increase. Complementary to the zip code modelling, a telephone survey was conducted among the region's residents, to evaluate their reaction to such a potential price rise.

Other considerations invoked in the assessment of patients' substitution patterns following a post-merger price increase included an account of prices of health-care services outside the Poplar Bluff region, patient loyalty and quality perceptions, geographic proximity of residents who live and work within the surroundings of Poplar Bluff to other hospitals, and access to hospitals through an insurance plan.

The case was heard before the District Court, which ruled in favour of the FTC. This outcome was nevertheless reversed in an appeal to the Circuit Court, and the merger was eventually cleared.<sup>161</sup> Regardless of the outcome reached in this specific merger, the case demonstrates how critical loss analysis can serve a convincing benchmark in market definition exercises, using simple and highly available data, to implement the SSNIP test and assess the likely effects of on competition.

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161 Compare, however, with Langenfeld and Li (2001), *op. cit.*, at 326-328, criticising the Circuit Court's broad geographic market definition.

***SunGard/Comdisco***<sup>162</sup>

Further application of the critical loss concept in antitrust litigation was carried out in the 2001 SunGard's acquisition of Comdisco. The defendants provided 'disaster recovery' capabilities for large scale enterprises, aimed at reducing the adverse and potentially devastating impact of a disaster (natural disaster, fire, terrorist act, etc') on computer systems, by enabling the restoration of critical computer applications and data. Disaster recovery services encompassed a range of services that varied both in terms of the type of computer platform on which they ran and the degree to which they were mission-critical. SunGard and Comdisco, along with a third company IBM, were providing one type of service, 'shared hotsites', a computer processing data centre owned and operated by a third-party. Shared hotsites offered a fully operational infrastructure needed for a quick recovery of the client's backed-up activities, until the client's original home system was restored.

The main economic problem in this case was presented by the definition of the relevant market. The Department of Justice's allegation presumed that shared hotsite services constituted a separate relevant market. In this vein, other existing types of disaster recovery services were not economic substitutes for the hotsites, due to the relatively low price of the service. As a result, for many captive customers the shared hotsite service was the only viable option, implying that a small price increase in its price was unlikely to induce significant substitution. In line with that definition, the proposed merger would result in a duopoly in which the combined shares of the merged firms would exceed 70%, with IBM controlling the remainder of the market.

In contrast, the defendants advocated a much broader definition of the relevant market, one that encompassed a number of other disaster recovery systems, most notably high availability solutions, internal hotsites and quick-ship services. Broadening the product market to include, for example, both external and internal hotsites for mainframe and midrange computers implied that SunGard's market share dropped to 20 percent, Comdisco's to 15 percent, and IBM's to 13 percent,<sup>163</sup> and alleviated the concerns over harm to competition resulting from the merger.

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162 U.S. v. SunGard Data Systems, Inc., 172 F. Supp. 2d 172 (2001). See the discussion of the case at M.L. Katz, Recent Antitrust Enforcement Actions by the U.S. Department of Justice: A Selective Survey of Economic Issues, 21 Review of Industrial Organization, 373 (2002) and NERA (2005), op. cit., at 126-128.

163 U.S. v. SunGard Data Systems, Inc., 172 F. Supp. 2d 172 (2001), at 187.



To establish their claim for a broad market definition the defendants relied on a critical loss analysis. In particular, they argued that the relatively high profit-margins derived from each additional customer would restrain any price increase. As dictated by the critical loss methodology, high-margins are associated with a low critical loss, as the company would need to lose only a few sales to make a price increase unprofitable. According to the defendants, if SunGard were to raise its prices, it would likely lose sales to such an extent that would render a 5% price increase unprofitable. In light of the uncertainty over customer reaction and the risk involved, SunGard was expected to refrain from any post-merger price increases. These propositions were accepted by the U.S. District Court, which noted:<sup>164</sup>

“As is clear, the demand of some customers for shared hot-site services is inelastic. The Court cannot, however, find that this is a substantial number given the availability of quick-ship solutions – especially for some midrange users – and the rapidly increasing availability of internal hot-site solutions for certain types of customers, depending on their size, their needs, and the computer equipment that they use. In light of the decreasing costs of equipment and telecommunications and the rapidly evolving computer technology, the Court cannot accept the government’s overly narrow and static definition of the product market. The defendants’ customers, as well as their computer systems, are simply too varied and too dissimilar to support any generalizations. Therefore, the central premise of the government’s case – that there are “a substantial number of customers for whom there are no competitive alternatives” (Gov. Reply at 4) – has not been proven. Accordingly, this Court will not enjoin the proposed transaction”.

### ***The Cruise Ships Merger Investigation***

In Europe, despite its apparent appeal, the critical loss technique has not yet been advanced by the Commission in a single case. It was, however, referred to by the UK Competition Commission in its 2003 Cruise Ships merger investigation, involving the three largest cruise ship companies in the world.<sup>165</sup> Although stating that an empirical application of the critical loss analysis could

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164 Id., at 193.

165 The merger was subject to simultaneous scrutiny by the EU, U.S. and UK antitrust authorities. Case COMP/M.2706 Carnival Corporation/P&O Princess, (2003) L 248/1; Statement of the FTC concerning Royal Caribbean Cruises, Ltd./P&O Princess Cruises plc and Carnival Corporation/P&O Princess Cruises plc., FTC File No. 0210041 (2002); P&O Princess Cruises plc and Royal Caribbean Cruises Ltd: A Report on the Proposed Merger, Cm 5536 (2002). The case is further discussed in detail in Chapter 5.

not be carried out as necessary data was unavailable, the UK Competition Commission did account for the relevant critical loss figures, stating that:<sup>166</sup>

“... we have found it useful to provide some guidance in estimating the proportion of customers an individual cruise operator would be able to lose after a 5 to 10 per cent price increase and remain as profitable. Based on Tables 4.4 and 4.12 reporting the financial performance of POPC and RCCL respectively, we have estimated this fall in passenger numbers to be around 9.5 to 11.5 per cent if prices were raised by 5 per cent, and to be around 17.0 to 21.0 per cent for a hypothesized 10 per cent price increase...though fully aware of its limitation, we found this estimate a useful benchmark against which to compare views on customers’ likely responsiveness to price changes, and thereby assess the profitability of a 5 to 10 per cent price rise”.

#### **4.9 Diversion Ratios**

Diversion ratio is a technique applied to assess the price effect of a merger in markets with differentiated products, where products are often substitutable, albeit not perfectly, for one another. When producers of two close substitutes merge, they have a strong incentive to unilaterally raise prices after the merger, since much of the sales forgone by the product whose price increased will likely be partially or totally captured by the other product. In particular, the degree to which the products are perceived as interchangeable by consumers will determine the effect of the merger on prices. A merger between first and second consumption choice products is likely to result in a significant price rise. In contrast, a merger between weak substitutes, or among brands that are sold to different types of consumers or throughout different channels, should have little effect on prices, due to the restraining effect of the availability of other alternatives in the marketplace.

In order to anticipate the effect a merger in a differentiated products environment would have on prices, antitrust authorities need information about the extent of closeness between the two products, and of substitution between the subject products and other products in the market. Such information can be obtained by using the diversion ratios approach.<sup>167</sup>

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166 P&O Princess Cruises plc and Royal Caribbean Cruises Ltd: A Report on the Proposed Merger, Cm 5536 (2002), at Chapter 5 para. 5.6

167 C. Shapiro, *Mergers with Differentiated Products*, 10 *Antitrust* 23 (1996). See also LECG (1999), *op. cit.*, at 93-95; Bishop and Walker (2002), *op. cit.*, at 373-376.

The term diversion ratio relates to the fraction of sales lost by product A due to its price increase that would be captured by product B. In other words, the diversion ratio measures the proportion of sales diverted from one product to another, upon a price rise. For example, suppose that the price of product A rises by 10%. What fraction of the sales lost by A would be gained by its substitute product B? This fraction is the diversion ratio from A to B, denoted  $D_{AB}$ . Assuming that the latter is equal to 0.5, this would mean that half of the sales forgone by A would be won by B.

An estimation of the diversion ratio therefore conveys some sense of substitution and the degree of closeness between products. When the diversion ratio is estimated to be 1, all the sales lost by product A are shifted to product B. In such a case, a merger between A to B is expected to reduce the degree of competition in the market, since clearly all consumers perceive product B as the first-best substitute to A. In contrast, a diversion ratio that equals zero indicates that consumers do not treat product B as a feasible alternative, since no sales forgone by A were shifted to B, and hence no elimination of competition is expected.

Diversion ratios can be estimated accurately if the relevant figures on cross-price elasticity of demand and own-price elasticity of demand are known. Specifically, availability of industry data permits calibrating a complete model of demand, accounting for the extent of direct competition between the merging brands that subsumes the calculation of diversion ratios, upon which predictions of post-merger price increases can be made. Yet, in the absence of such data, there are less sophisticated and readily available measures to derive diversion ratios. One can, for example, use evidence from consumer surveys formulated to track down consumer's expected reaction to an increase in the price of their preferred product.<sup>168</sup>

Estimated diversion ratios can be further utilised in certain circumstances to make inferences about the likelihood of a post-merger price rise. Such a prospective price increase can be assessed using the following formula:

$$(15) \quad (P^* - P)/P = mD/(1 - m - D)$$

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168 For example, a consumer survey which asks: "If you could not buy your preferred product, which product, if any, would you buy instead" presents the consumer with a fairly simple and non-hypothetical question, and allows a reasonable approximation of the diversion ratio. See CRA International, Competition Memo, New Developments in Merger Analysis, Part 2 (October 1996).

Here,  $P^*$  is the post-merger price,  $P$  is the pre-merger price, 'm' is the pre-merger price-cost margin (percentage mark-up above marginal cost) and  $D$  is the diversion ratio between the two merging brands.

To illustrate the use of this formula, suppose that the pre-merger price is €50, and the cost per unit is €30. This implies a pre-merger mark-up of  $(50-30)/50 = 0.4$ , or 40%. If the diversion ratio between the products of the merging firms is known to be  $D = 0.2$ , then the anticipated post-merger price increase (namely one that would maximise the firms' profits) can be calculated to be  $(0.4 \times 0.2)/(1 - 0.4 - 0.2) = 0.2$ , which means that the merged entity is likely to raise prices by 20%.<sup>169</sup>

#### 4.9.1 Potential Pitfalls in the Application of Diversion Ratios

Applying the above formula to calculate proportionate post-merger price increase has to be done with great caution, as it rests on three very restrictive assumptions. First, it assumes constant elasticity of demand over the relevant range of price. If the actual elasticity of demand increases when the price of that brand is raised (as is the case with linear demand for example), any calculation based on the constant elasticity assumption will overestimate the post-merger price increase. Consequently, although constant elasticity is a fairly ordinary assumption applied by economists, employing it in the context of the above formula can only provide an approximation of the true percentage of the price increase. Second, the formula assumes that the two merging firms are symmetric prior to the merger (and have the same price-cost margin), a condition that rarely holds in practice. Third, it assumes that each one of the firms only sells a single product. Relaxing any of these assumptions renders the simple diversion ratio equation practically useless.<sup>170</sup>

An additional rigid assumption inherent to this analysis is that there will be no new entry or product repositioning after the merger, and that there are no synergies associated with the merger. However, if the merger is expected to induce new entry into the market, any price increase estimated on the basis of given diversion ratios will tend to be overestimated, and the analysis would thus have to focus on the ability of new competitors to defeat the price rise.<sup>171</sup>

169 In a more real-life related example, CRA International (1996), *op. cit.*, utilised the diversion ratio technique to estimate the expected post-merger price increase in the famous merger between Kimberly Clark and Scott Paper (addressed in several places throughout this book). With several tentative assumptions concerning the merging firms' margins and diversion ratios taken into account, they were able to exemplify that the price of Andrex, Scott Paper's leading brand, was expected to rise by 10% following the merger, which may serve to justify the divestiture requirement imposed on the parties.

170 CRA International (1996), *op. cit.*; Bishop and Walker (2002), *op. cit.*, at 378-379 derive diversion ratio formulas for asymmetric firms, and for two-product firms.

171 CRA International, *op. cit.*

Further common complications result from the ambiguous correlation between diversion ratios and market shares. In fact, diversion ratios cannot be calculated on the basis of the market shares of the firms. Suppose, for example, that product A has a 30% market share and product B a 35% share. It is sometimes assumed that the diversion ratio from A to B is 0.245 (35% of 70%) and that the diversion ratio from B to A is 0.195 (30% of 65%). However, such an inference would be incorrect for two reasons.

First, such a connection relies on an uncontroversial conclusion with respect to the definition of the relevant antitrust market, which is a pre-condition for the calculation of market shares. However, having to delineate a relevant market removes the entire advantage of the diversion ratio approach, which aims at directly quantifying potential post-merger price effects.

Second, estimating diversion ratios from market share figures implicitly assumes that all products within the relevant market are equally close to each other (implying that all cross-price elasticities between the products are identical), namely, that all sales forgone by A are inevitably diverted to B, and vice versa, which is not necessarily true.<sup>172</sup>

As a final observation, to avoid potential caveats, it is possible to check the consistency of the estimated diversion ratios used for the competitive assessment. This may be achieved by considering the important relationship between diversion ratios, price-cost margins, and demand elasticities, grounded in microeconomic theory. According to the assumption that the merging firms act non co-operatively in a Nash equilibrium setting,<sup>173</sup> a firm's price-marginal cost mark-up should be equal to the inverse of its own-price elasticity of demand.<sup>174</sup> Consequently, knowing the price and marginal costs, it is possible to recover the value of the own-price elasticity of demand. Particularly, the diversion ratio from product A to product B is known to equal the cross-price elasticity of demand for A with respect to the price of B, divided by the own price elasticity of demand for A.<sup>175</sup> This means, that once the diversion ratio between A and B and the own-price elasticity of demand for A are obtained, it should be possible to calculate the cross-price elasticity of A with respect to the price of B.<sup>176</sup> In other words,

172 Id.

173 In economic terms this implies a Bertrand competition in prices. For elaboration, see Pindyck and Rubinfeld (2005), *op. cit.*, at 449-452. A Bertrand setting is commonly applied in differentiated products industries. See C. Shapiro, *Mergers with Differentiated Products*, Address before the American Bar Association and International Bar Association program, *The Merger Review Process in the U.S. and Abroad*, Washington DC (November 9<sup>th</sup>, 1995).

174 Pindyck and Rubinfeld (2005), *op. cit.*, at 345.

175 LECG (1999), *op. cit.*, at 94.

176 In specific, if  $D_{AB} = \epsilon_{AB}/\epsilon_{AA}$  then  $\epsilon_{AB} = D_{AB} \times \epsilon_{AA}$

once the relevant figures concerning the prices and marginal costs of the merging firms together with estimated diversion ratios are obtained, it is simple to deduce the respective cross-price elasticities between A and B. To check the consistency of the above estimations, it is possible to use another economic relationship, the Slutsky symmetry,<sup>177</sup> which establishes the connection between the two cross-price elasticities, to verify the conclusions of the diversion ratios analysis.<sup>178</sup> The important point to be made here is that any inconsistency in the above calculations can reveal that one of the underlying assumptions is not valid, and hence that the overall analysis is compromised. As a result, diversion ratios should be used as part of a complete analysis of the industry under investigation, in conjunction with other data available at hand.

#### **4.9.2 The Application of Diversion Ratios in Competition Law Analysis**

Generally, the diversion ratio approach offers the advantage of evading a protracted definition of the relevant market. As previously discussed, market definition provides a benchmark for assessing market power, upon which the competitive effects of a merger and the likelihood of a post-merger price increase are evaluated. As such, market definition is not an end in and of itself, but rather a preliminary step which aims at detecting significant market power and preventing its harmful outcomes. Consequently, the calculation of market shares is used as a proxy to identify the dominant competitors operating in the market. However, using the diversion ratio method, one may skip relevant markets and market shares altogether and directly arrive at the assessment of the effect of the merger on competition. Estimated diversion ratios provide interim predictions for the incentives to unilaterally increase price following a merger between rival brands, and allow a direct inference on whether a merger should be cleared or condemned, thereby reducing the inherent reliance on the market definition exercise. This issue is illustrated below.

##### ***Vail Ski/Ralston Resorts***<sup>179</sup>

Vail Ski Resorts and Ralston Resorts were the two largest ski operators in Colorado, which owned and operated two and three ski resorts respectively, all located in close vicinity to Denver. The complaint alleged that a transaction between them would bring together several of the largest ski resorts in the region,

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177 The Slutsky symmetry implies that the cross price elasticity of A with respect to the price of B is equal to the cross-price elasticity of B with respect to the price of A, multiplied by the ratio of sales of B to the sales of A.

178 Bishop and Walker (2002), op. cit., at 376 demonstrate how a diversion ratio estimate may fail to comply with the above economic relationships, in which case the conclusions of the analysis obviously need to be reconsidered.

179 U.S. v. Vail Resorts, Inc., Civil Action No. 97-B-10 (D.C. Colorado, 1997).

leading to an increase in concentration and threatening to raise price or reduce current discounts on skiing. The investigation focused in particular on 'Front Range Skiers' skiers, namely skiers who lived in the area and skied regularly. This group of skiers was typically seeking a day or a weekend ski trip falling within a rather limited radius from where they live, and were therefore more interested in mountains and ski facilities than in resort amenities. Ski resorts often attracted Front Range skiers throughout a variety of promotions, such as discount prices on lift tickets or frequent skiers cards, which were not generally available to destination skiers who came from outside Colorado.

According to the complaint, all five ski resorts owned by the merging parties were located close to each other, and constituted a primary target for Front Range Skiers. Such skiers, it was contended, would not turn to resorts outside the region in sufficient numbers to defeat a small but significant and non-transitory price increase imposed by the resorts within that radius. Thus, resorts located further away could not significantly constrain a potential increase imposed by the merged entity on the price charged to Front Range skiers. Accordingly, the complaint considered the provision of downhill skiing to Front Range residents a relevant antitrust market, in which Vail and Ralston competed head-to-head.<sup>180</sup>

To understand how the merger would affect the merging parties' pricing decisions, it is useful to consider pricing strategies before and after the transaction.<sup>181</sup> Whilst serving the same end-use, ski resorts tend to differ in characteristics (such as terrain and services) and are hence valued differently by different consumers. Prior to the merger, any increase in the price of a lift ticket by Vail Ski, for example, would probably have induced some skiers to switch to a different ski destination. As a result, any additional profit earned on the remaining skiers would have to be offset by the loss of consumers who chose not to buy their ticket there anymore. Following the merger, however, skiers who chose to substitute Vail Ski with one of the Ralston resorts would no longer be counted as lost sales. These consumers would in fact be re-captured by the merged entity, rendering the hypothesised price increase potentially profitable. In economic terms, the percentage of those skiers is the diversion ratio. If the diversion ratio is high, namely, the percentage of sales diverted from Vail to Ralston is substantial, the likelihood of a post-merger unilateral price increase is raised.

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180 Note, however, that market definition was not the focus of the discussion, nor did it rest on shown economic evidence. It also did not serve the ensuing analysis of the competitive implications of the merger. Rather, as discussed below, the assessment was based upon economic estimation of the diversion ratios between the merging firms, and the relevant figures on elasticities and margins, to predict the magnitude of the post-merger price increase.

181 NERA (2005), *op. cit.*, 124-126.

To quantify the magnitude of this potential price effect, it was necessary to gain information on the relevant elasticities of demand, margins and the diversion ratio. In the case at hand, data on the firms' margins was derived from their accounting and marketing documents. Furthermore, the own-price and cross-price elasticities together with the estimated diversion ratios were obtained using consumer surveys. These surveys asked respondents to rank and compare ski resorts under different price and snow conditions, and therefore allowed an assessment of consumers' willingness to shift between alternative ski destinations. In conjunction with additional information on costs, prices and the demand for that market, economic analysis permitted an estimation of the expected post-merger unilateral price increase. It was concluded that Front Range skiers would likely experience an average 4% increase in the price charged for a lift ticket (or about \$1 extra per lift ticket), with higher price increases at the merging parties' resorts. Consequently, as the merger was anticipated to lessen competition in the market, it was approved only upon divestiture of one of Ralston's ski resorts.

#### **4.10 Price Concentration Analysis**

Price concentration studies investigate the relationship between prices and the level of industry concentration.<sup>182</sup> The technique draws on a structuralist view of the market operation, according to which market structure determines the performance of market participants via their conduct. By assuming that market concentration (used as a proxy for market structure) influences market performance (firms' profits) by virtue of the effect it has on pricing, price concentration studies can be used to establish whether high concentration in a particular market should be associated with greater market power. The underlying theory is simple: significant market power leads to high prices (firms with market power can maximise their profits by charging prices above their marginal costs of production). Hence, when the analysis shows that higher levels of concentration coincide with higher prices, it may be reasonably assumed that this concentration is associated with the possession of market power.<sup>183</sup>

Commonly, price-concentration studies consider the relationship between price and concentration levels across different geographic locations. The analysis compares price data collected from different areas (whereby the alleged anti-competitive

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182 Bishop and Walker (2002), *op. cit.*, at 421.

183 For a review and critique see C.M. Newmark, *Price-Concentration Studies: There You Go Again*, Prepared for the DOJ/FTC Merger Workshop, "Concentration and Market Shares" panel (February 14, 2004).



concern affects only one of them) against the degree of concentration in these areas. It thus aims at establishing whether the markets in which concentration is high are also those in which the price is high. Price-concentration analysis employed in the context of merger investigations focuses upon identifying an observable systematic relationship between price and concentration in the provisional market. The existence of such apparent relationship (i.e. evidence showing that prices tend to be higher when concentration is higher) can signify that the merger might lead to an increase in price above the prevailing level, whereas its absence may suggest that an increase in concentration might not result in a post-merger price rise.<sup>184</sup>

Suppose, for example, that two office-supply superstore chains, each having a large number of outlets and selling in many cities, wish to merge. Such a merger will have an anti-competitive effect if in areas where concentration will increase due to the merger, prices will rise respectively. In such circumstances, carrying a comparative analysis of prices between regions may provide important insights into the investigated relationship between price and concentration. For instance, data demonstrating that prior to the merger prices were significantly higher in cities where each of the merging parties was the only office-supply superstore serving the area, can support the conclusion that a post-merger price increase is probable.

Moreover, one advantage of this approach is that it may be instrumental not only for mergers but also for dominance (i.e. Article 82) cases.<sup>185</sup> In such instances, price-concentration studies can be used to rule out the maintenance of market power by the allegedly dominant firm, if evidence fails to confirm a clear relationship between prices and the degree of concentration. Importantly, these studies are particularly constructive in this context, since they are able to overcome the cellophane fallacy problem and hence the issues of interpreting spurious high elasticities or false price correlations, discussed herein.

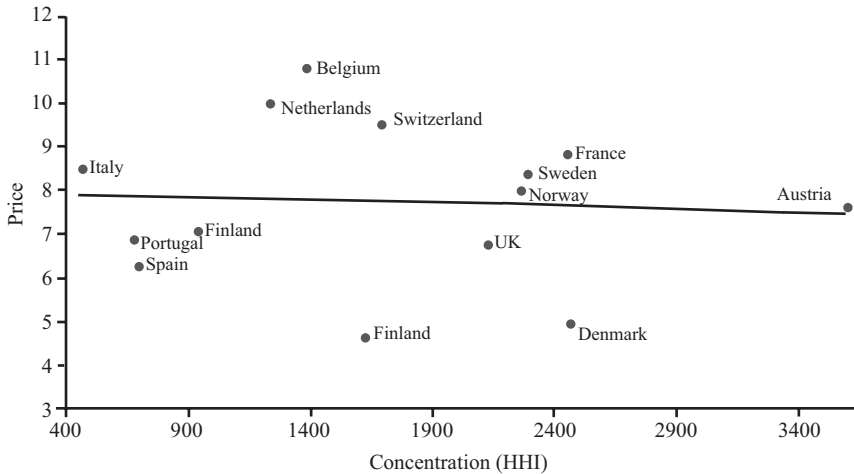
Price-concentration analysis can be undertaken both graphically and econometrically. The former approach is very straightforward, and requires simply graphing prices in every area against concentration in that area. The following graph demonstrates a case where no clear relation between price and concentration can be established.<sup>186</sup>

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184 For an overview of price-concentration studies conducted in the context of mergers see P.A. Pautler, *Evidence in Mergers and Acquisitions*, U.S. Federal Trade Commission, Bureau of Economics, Working paper No. 243 (2001), at 42-47.

185 Bishop and Walker (2002), *op. cit.*, at 420.

186 CRA International (2003), *op. cit.*, at 32. Drawing a line of best fit through this data may give a rough approximation for the increase in price that is expected after the merger.

**Figure 3. Price-Concentration Results**

The graph examines whether an observable connection exists between the level of concentration in multiple national markets for a product (represented by the different countries), and the prices charged in these markets. As can be seen, on the basis of the data presented it would be difficult to reach generalised conclusions regarding this relationship. Denmark, for instance, exhibits a high level of concentration but low prices, whereas Portugal features lower concentration but higher prices. Drawing a ‘best fit’ line on this chart illustrates that prices in fact do not tend to increase together with the level of concentration. The dispersion of data points to the absence of identifiable systematic correlation between the two factors.

Generally speaking, such evidence may be used to support two alternative hypotheses. First, that the relevant market was too narrowly defined, which explains why prices and concentration appear to be unrelated.<sup>187</sup> Second, that the market was correctly defined, but there are other constraints on the exercise of market power (e.g. easy entry into the market or high degree of supply-side substitution).

The above relationship between price and concentration can be studied with more accuracy if econometric techniques are employed.<sup>188</sup> An econometric

187 For example, in Case IV/M.1075 Nordic Capital/Molnlycke Cliical/Kolmi, (1998) OJ C 39/19, concerning a merger between producers of sanitary surgical equipment (gowns, drapes and swabs), such evidence was utilised by the parties to show that the relevant geographic market was not national, but rather as wide as the EEA. See CRA International (2003), *op. cit.*, at 32.

188 E.g. W. Beckert, Price-Concentration Analysis in Merger Cases With Differentiated Products, UK Competition Commission (March 14, 2006).

analysis would seek to investigate how prices are affected by several factors (concentration among others), and will assist in establishing whether an alleged positive correlation does not result from other factors which were not unintentionally neglected.<sup>189</sup> The analysis requires all the variables which affect prices in each area and which vary among regions, to be isolated. Apart from concentration, relevant variables may include wages, rent, local taxes, input prices, and any other factor which is likely to differ from one area to another and hence influence prices. Factors that are constant in all areas are, on the other hand, irrelevant for the investigation, since they do not assist in explaining the above price differences.

Technically speaking, the foregoing econometric analysis will include regressing the price variable on each one of the explanatory variables. In other words, the analysis will account for the individual impact each independent variable has on the price, and will generate a coefficient – a number between -1 and 1, which expresses quantitatively the effect of the relevant variable on the price. A coefficient of 1 on the concentration variable will signify that price is perfectly correlated with concentration, and that higher levels of concentration are thus going to dictate higher prices. A low or negative correlation would imply no relation, or an opposite one.

#### **4.10.1 Analytical Issues of Implementation**

Conducting a price-concentration analysis requires comparing similar products in different regions. The analysis might be, however, more complicated to carry out, if across regions products are not entirely homogeneous, or if more than one product is under scrutiny. Contrasting differentiated products is far more difficult, as price variations often reflect quality differences, or disparity of the preferences of the local population. Thus, in order to produce a meaningful result, the analysis must be able to account for any heterogeneity.<sup>190</sup>

Another assumption implicit in the implementation of this technique is that marginal costs are constant. However, it is often the case that marginal costs differ in different locations, a factor which might generate a bias in the analysis, since higher prices would not necessarily correspond to higher levels of profitability. Based on the postulated theoretical relationship between market structure and market performance underlying the technique, it has been suggested by some scholars that the analysis should focus upon margins, rather than marginal costs,<sup>191</sup> as only the latter are enjoyed by firms with market power.

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189 Bishop and Walker (2002), *op. cit.*, at 424-426, 429-432, and LECG (1999), *op. cit.*, at 87-90, elaborate on the econometric approach.

190 Bishop and Walker (2002), *op. cit.*, at 428.

191 *Id.*, at 427; LECG (1999), *op. cit.*, at 89.

An important aspect of the analysis relates to the choice of an appropriate measure of concentration. As previously discussed in Chapter 2, several concentration ratios are frequently employed in competition analysis. Industry concentration can be measured using the CR8 ratio (the sum of market shares of the eight largest firms) or the CR4 (the sum of market shares of the four largest firms). An alternative measure is the Herfindahl-Hirschman Index (HHI), which measures the sum of the squares of the market shares of every firm in the market.

Deciding which concentration measure is suitable depends upon the industry in question, and upon the data available. Although the HHI is considered the most informative measure,<sup>192</sup> it will not always be possible to estimate the market shares of all the firms operating in the industry, in which case it will be easier to use other concentration ratios. Whether it will be a four-firm ratio or a three-firm ratio depends on the circumstances of the case, and the number of significant industry leaders. Nevertheless, it is important to ensure that all the dominant competitors within the market are considered in the analysis.

Regardless of the concentration ratio employed, it should be stressed that convincing results can only be achieved if the analysis contrasts areas with low levels of concentration against areas with high levels of concentration, otherwise observable price differences could not be fully appreciated.<sup>193</sup>

#### **4.10.2 Price-Concentration Analysis and Market Definition**

As elaborated above, price-concentration studies are designed to provide a straightforward answer to one of the following questions, central to most competition law inquiries:

- (1) Will prices increase after a merger?
- (2) Does a dominant firm exercise market power?

Providing a direct answer to these questions may diminish the need for a protracted market definition, dictated by the current competition law methodology. While market definition is originally intended to facilitate the identification of significant market power, price-concentration analysis can immediately obtain the economic consequences of exercising such market power, namely its abuse. In merger investigations, proof of a high likelihood of a unilateral post-merger price increase may suffice to block the transaction, while vacating the need to reach a decisive conclusion regarding market boundaries. In Article 82 cases, the need for market definition diminishes if the investigated conduct itself confirms both the existence of a dominant position and its abuse.<sup>194</sup>

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192 The HHI is the standard measure of concentration both in the U.S. and EU, and is incorporated into the U.S. and EC Horizontal Merger Guidelines.

193 Bishop and Walker (2002), *op. cit.*, at 428.

194 Van den Bergh and Camesasca (2006), *op. cit.*, at 124.

Assume, for example, that antitrust enforcers adhere to a narrow market definition, within which the parties are found to occupy a central position. In this case, rather than challenging the proposed market definition and contesting the extent of the relevant market, the merging parties (or the allegedly dominant firm) can utilise price-concentration studies to show that regardless of the manner in which market boundaries are portrayed, such abuse is unlikely to occur. Price-concentration analysis may therefore be employed to refute unfounded anti-competitive concerns by competition authorities, without having to quarrel over market definition.<sup>195</sup>

Nonetheless, it should be recognised that omitting all reference to market boundaries, even in ambiguous terms, seems to be impossible. Price-concentration studies must denote some measurement of concentration against which prices in different areas are compared. With no conception of the size of the relevant market, market shares cannot be calculated and concentration ratios cannot be derived. It is quite possible, however, that a preliminary assumption made with respect to the size of the relevant market will be reconsidered later, if studies fail to distinguish any apparent relationship between price and concentration, thus implying that the relevant market is wider than previously thought.

#### 4.10.3 Implementing Price-Concentrations in Competition Law Analysis

##### *Staples/Office Depot*<sup>196</sup>

A good illustration for the merits of price concentration analysis can be found in the 1996 Staples/Office Depot merger case. Staples and Office Depot, two out of three leading superstore chains (with Office Max being the third), were selling consumable office supplies in metropolitan areas of the U.S. The FTC successfully challenged the merger, arguing that within a narrowly defined market, consisting of ‘the sale of consumable office supplies through office superstores’, the merger was likely to have an anti-competitive effect. To prove this contention, the FTC presented extensive evidence on pricing decisions of the merging firms in different U.S. locations. Weekly data covering more than 400 Staples stores spread over more than 40 cities and over eighteen months have demonstrated that the prices charged by Staples and Office Depot tended to be considerably

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195 Bishop and Walker (2002), op. cit., at 420-421.

196 Federal Trade Commission v. Staples Inc., 970 F. Supp. 1066 (D.D.C. 1997). See the case discussion at J. B. Baker, *Econometric Analysis in FTC v. Staples*, Paper presented before the American Bar Association’s Antitrust Section (July 18, 1997), and O. Ashenfelter, D. Ashmore, J.B. Baker, S. Gleason and D.S. Hosken, *Econometric Methods in Staples*, Princeton Law & Public Affairs Paper No. 04-007 (2004).

higher (well above the 5% figure) in cities where either of them was the only superstore. Put differently, Staples' prices were higher in local markets where it faced no competition from another office supply superstore. On the other hand, in cities where both Office Depot and Staples operated, or in the presence of the third superstore OfficeMax, head-to-head competition has ostensibly driven prices down.

Moreover, the FTC was able to demonstrate that this pricing strategy was directly linked to superstore competition. The defendants apparently moved stores into 'lower price zones' in response to the threat of entry from a rival superstore, but did not respond in the same manner to competition from other retailers selling similar products. This indicated that Staples and Office Depot felt particularly threatened by superstore competition, even though their products were sold by many other adjacent retailers. In line with this evidence, the Federal Court established the sale of consumable office supplies through office supply superstores to be the appropriate relevant product market for the purpose of considering the possible anti-competitive effects of the merger between Staples and Office Depot. The FTC inquiry into the observed relationship between the price and the number of competitors allowed a direct inference on the possible effects of the proposed transaction, and suggested that after the merger the parties were likely to increase prices in the face of weakened competition.

### ***Praxair/ Liquid Carbonic Corporation***<sup>197</sup>

A similar approach was implemented during the investigation into Praxair, Inc.'s acquisition of Liquid Carbonic Corporation, two suppliers of liquid gases to industrial customers who operated in various locations across the U.S. Delivery of industrial gas is highly limited in range due to its high cost, and as a result, each plant typically supplies a localised area. However, in the case at hand, some of the merging firms' plants had overlapping market areas. Overlaps also existed between some of the parties' plants and the plants of one or more competitors. The question was therefore whether the reduction of the number of suppliers following the merger would induce higher prices in markets where Praxair and Liquid Carbonic had overlapping plants.

To assess the effect of the merger, the analysis considered the HHIs for each Praxair plant's market area (both overlapping and non-overlapping plants) and the relationship between price and HHI across them.<sup>198</sup> This was done using

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197 See the case discussion at NERA (2005), *op. cit.*, at 152-154.

198 HHI levels tended to vary greatly, depending on the amount of competing plants located in the area. Isolated plants which faced little competition had relatively high HHIs, while plants that faced many competitors had small HHIs. Consequently, the data offered great opportunity to associate price differences with the level of concentration in the market.

an econometric model, which specified the price charged by the plant utilising the plant's costs, vicinity, distance to the nearest competing plant, and the HHI measured for that area as the explanatory variables.

The results reflected no apparent relationship between price and HHI except at the very highest levels of HHI (i.e. plants that were located in areas with very few competing plants, or none). This result was consistent with the proposition that the merger would bear no anti-competitive effect in most of the markets where the merging parties' activities coincided.

#### 4.11 Bidding Studies

Bidding studies are used to highlight the competitive constraints in markets where competition takes the form of bidding for individual contracts. In such markets, sales are based on a tender process, in which several firms compete (i.e. bid a price) to win the tender.<sup>199</sup> An extensive range of products is sold in this manner, most typically contracts for major infrastructure and capital investment projects (e.g. refineries, power plants), ship building, airlines and television broadcasting. These auctions are characterised by information asymmetries, as each bidder does not know what his competitors' offerings would be.<sup>200</sup> Unlike standard market operation, where a firm setting an excessive price would attract a lower volume of sales, bidding markets exhibit competition for the whole market: a firm placing a high bid will lose the tender, whilst the winner – the firm which provided the lowest bid – will serve the entire market.<sup>201</sup> Under these circumstances, competition is primarily 'for' the market rather than 'in' the market, since the winner of the tender acquires exclusive control over the total sales that will further be made in that market<sup>202</sup>.

The 'all or nothing' outcome featuring the competitive process carries far-reaching implications for the analysis of market power. A commonly investigated scenario would involve an intention of two suppliers of a product or service to merge, raising the concern that competition in the market will be compromised.

Suppose, for example, that three suppliers, A, B and C, are active in the market for large commercial aircrafts. In this market, airlines choose their

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199 Bishop and Walker (2002), *op. cit.*, at 434.

200 LECG (1999), *op. cit.*, at 103.

201 The opposite can also be true, as in some bids the winner will be the one to offer the highest price.

202 For an overview of the economic literature, theory and empirical research of bidding mechanisms, see R.P. McAfee and J. McMillan, *Auctions and Bidding*, 25 *Journal of Economic Literature* 699 (1987); K. Hendricks and H.J. Paarsch, *A Survey of Recent Empirical Work Concerning Auctions*, 28 *Canadian Journal of Economics* 403 (1995).

suppliers using a tender process, in which each supplier offers a bid (a price) for selling the aircraft to the airline. A typical question asked is whether a potential merger between two of the suppliers, reducing the number of market participants (bidders) from three to two, would reduce the competitiveness of the market. Bidding studies can provide insights into whether such competitive concerns are misplaced, and may assist in evaluating whether the two merging firms directly compete with one another. The analysis would consider whether the merging firms already competed against each other in the past, and at what frequency. If, for instance, tenders in the investigated industry are large and infrequent, it may very well be the case that even with the reduction in the number of rivals the market would remain competitive, due to the grave consequences associated with failing a bid. Moreover, the analysis could reveal past reactions of incumbents, hence shedding light on the disciplinary effect other players in the market might have.

Considering the aircrafts example, assume that bidding data was collected for the years preceding the merger, reflecting a significant downward effect caused by the presence of firm C in the tender. Apparently each time firm C posted a bid, prices paid by airlines were substantially lower, compared to tenders where firm C did not participate. Such a result may imply that firm C is a major player in the market, and has a constraining effect on the behaviour of firms A and B (assuming that the tender participants gather in advance information about the number and identity of their rivals). Consequently, a merger between firms B and C may be deemed to weaken competition in the market, since it will result in higher aircraft prices, translated into higher ticket prices paid by consumers.

#### **4.11.1 Bidding Studies and Market Power Analysis**

Bidding studies are mostly utilised in evaluating the likely effect of a merger on the degree of competition in the market. Nonetheless, they tend to be less informative as far as the definition of the relevant market is concerned. The reason is that these studies mainly contribute to the assessment of the closeness of rivalry between two parties to a merger, and hence to the prospect of a post-merger price increase for consumers. They are of lesser value in defining the exact boundaries of the relevant market and identifying the overall group of strongest competitors. Bidding data can reflect who the most repeated players in the market are, how often firms bid against each other, or how many firms bid for each tender. This type of information does not directly address the SSNIP methodology, and can sometimes by-pass the need for a vigorous market definition, as long as the patterns underlying bidding strategies are identified, and can potentially testify whether a competitive environment can be effectively maintained subsequent to the merger.



A closely related issue arising in these markets is the inadequacy of the traditional market shares analysis. Current market shares merely reflect the success of firms in former bids, yet convey no information regarding future players in the market.<sup>203</sup> It is possible, for example, that a firm with a small market position will impose an effective constraint on the behaviour of incumbents, as the latter would try to maintain their market control. Moreover, every bid offers the opportunity for a new firm to enter the market and gain a considerable share. Consequently, existing market shares figures can sketch a misleading picture of the competitive forces, and market leaders' dominance may be transitory.

The *Boeing/McDonnell Douglas*<sup>204</sup> merger case provides a good illustration, where Boeing's acquisition of McDonnell Douglas (two of the three firms operating in the market for commercial aircrafts) had resulted in a mere 6% increase in its market share, but had jeopardised the degree of competition in the market by eradicating a credible competitor, according to the bidding data.<sup>205</sup>

A more important question in bidding markets therefore concerns not the market shares of the competitors, but rather the sufficient number of bidders in an industry. Would a merger between two of the three aircraft suppliers leave the market uncompetitive? The answer depends on the specific conditions prevailing in the market.

One way to assess the potential loss for competition and to test whether firms are competitively close to one another is to observe the behaviour of buyers. It is often the case that buyers only appeal to a limited number of firms to participate in the tender for a potential contract. In the case of *Price Waterhouse/Coopers & Lybrand*,<sup>206</sup> for example, historical bidding data revealed that most clients of audit and accounting firms asked three or four of the six large firms to bid. That information was used to establish that a merger between two of the leading six was unlikely to endanger the competitive environment, because the merged firm would be constrained by the competitive behaviour of the remaining four large ones.<sup>207</sup>

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203 Bishop and Walker (2002), op. cit., at 435, 437.

204 Case IV/M.877 Boeing/McDonnell Douglas, (1997) OJ L 336/16.

205 In particular, a study of 54 aircraft biddings covering the three years preceding the investigation has indicated that the presence of McDonnell Douglas Corporation (MDC) has consistently pushed prices downward. That is, prices paid by airlines were significantly higher when MDC was not a bidder than when it was. See CRA International (published originally by Lexecon Ltd.), Competition Memo: Boeing/McDonnell Douglas (July 1997). See also para. 58 of the Commission decision: "Out of the 20 airlines, 13 stated that competition from MDC had an influence on the outcome of their negotiations with the winner of the bid in terms of a better price or better purchasing conditions".

206 Case IV/M.1016 Price Waterhouse/Coopers & Lybrand, (1999) OJ L 50/27.

207 Id., at para. 94.

Another way is to investigate how often the merging firms were the first and second most competitive bidders in the tender (i.e. submitted the lowest and the next lowest offers). If data reflect that this scenario is prevalent, it is can be fairly assumed that the buyer will have to pay a higher price after the merger when the two firms become one, since the most immediate competitive constraint would be removed.<sup>208</sup>

Under certain circumstances, it is even possible that the existence of two bidders would be sufficient for a competitive bidding process to take place. In 1991, the UK Independent Television Commission awarded 15 regional franchises for television broadcasts. Of the 37 applications submitted, it appeared that in three franchises there was only one bidder, in four franchises there were two bidders, in two franchises there were four bidders, and in six franchises there were six bidders.<sup>209</sup> This bidding pattern was probably created due to the different characteristics of every franchising area, such as the number of households, leading to a different value of the area to bidders seeking to exploit the advertising potential.

As the number of bids and the exact amounts were publicly announced, it was possible to analyse how these bids varied according to the number of bidders. A calculation of the average weighted bid<sup>210</sup> showed that bids became significantly higher when moving from one bidder to two. Surprisingly though, there was a very small difference in the average size of the bids when comparing franchises with two, three or four bidders. This implied that the most significant competitive constraint was exerted in the presence of at least two bidders, while any additional bidders did not make a considerable difference. In that specific situation, two bidders were enough to ensure a competitive outcome.

#### **4.11.2 The Application of Bidding Studies in Competition Law Analysis**

##### ***Philips/Agilent*<sup>211</sup>**

The acquisition of Agilent Helathcare Solutions Group by Philips Medical Systems may serve to further illustrate the potential contribution of bidding studies to competition analysis. Philips was a multinational company active in the manufacture and sale of electronic products for domestic appliances and

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208 Bishop and Walker (2002), op. cit., at 438-439.

209 ITC announces Channel 3 license awards, Press Release (October 16, 1991).

210 Bishop and Walker (2002), op. cit., at 436 and Lexecon (1999), op. cit., at 17 calculate the variations in average bids tendered differently, although their general conclusion remains the same.

211 Case COMP/M.2256 Philips/Agilent Helath Care Solutions, (2001) OJ C 292/10.

medical purposes, and in particular medical imaging equipment, magnetic resonance nuclear medicine and ultrasound. Agilent HSG, a U.S.-based company, operated in the research, development, manufacture and sale of communication, electronics, science and healthcare products, including ultrasound imaging equipment, patient monitoring devices and cardiac therapeutic equipment. Hence, the main competitive overlap concerned the production and sale of ultrasound imaging equipment. The parties argued for a broad definition of the relevant market comprising the overall market for ultrasound machines including all types of clinical applications. Furthermore, the parties stressed that the market was moving towards scalable systems, which would allow the use of a single platform across different medical applications, providing customers with multipurpose machines.

The Commission, on the other hand, adhered to the distinction between different ultrasound applications (such as radiology, obstetrics, gynaecology and cardiology), and the differences between the product ranges (high-end versus mid-range and low-end machines) with respect to their price, capacity and performance. However, its final conclusion was that the merger would not provide Philips/Agilent with a dominant position, either in the overall ultrasound market or in the more narrowly defined market for cardiology applications. Estimated market shares of the merged entity supported this result, together with the existence of strong competitors even after the merger, and the prospect for intensive technological innovations at a relatively rapid pace.

Importantly, these findings were confirmed by the Commission in an economic study supplied by the parties, based on ‘win/loss’ data. The data documented the results of tenders won and lost by HSG in cardiac ultrasound during the period 1998/99 and 2000. It reflected that in projects won by HSG, Siemens/Acuson and GE were placed second, whereas projects that were lost by HSG were won by GE, Siemens/Acuson and ATL.<sup>212</sup>

The abovementioned studies assisted in establishing that the concentration would not remove the closest substitute in the market. Whilst Philips and Agilent were both present in the market for cardiac ultrasound machines, it was GE and Siemens/Acuson which were the strongest challengers on HSG’s projects, both won and lost, with ATL generally ranked third. In light of these observable competitive constraints, it could be fairly assumed that the merger would not strengthen the parties’ position or allow them to increase prices unilaterally.<sup>213</sup> Economic evidence in this case complemented the standard qualitative analysis

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212 The exact figures remained confidential. *Id.*, at para. 34.

213 *Id.* at para. 35.

by identifying and ranking the most prominent rivals in the market, effectively quantifying the closeness of competition between the parties. As it was discovered that the parties were not the only rivals, or even the closest ones, the Commission was able to leave the exact product market definition open, since in all possible alternatives, the proposed transaction did not raise any competition concerns.

***General Electric/ Instrumentarium***<sup>214</sup>

Bidding studies formed a critical part of the competitive assessment also in the merger between the U.S. company General Electric (GE) and the Finnish company Instrumentarium. GE was active in various manufacturing, technology and service businesses, including medical systems, which specialised in medical diagnostic imaging technology, patient monitors, and related services and health care products. Instrumentarium was active in the development, manufacture and sale of medical equipment and technology related to the areas of anaesthesia and critical care, including patient monitors and anaesthesia delivery machines. The proposed concentration therefore affected the field of medical equipment, and in particular patient monitors, mobile C-arms and mammography devices. In each one of these market segments, the transaction was found to lead to high market shares and significant overlaps in several of the national markets considered.

In order to estimate the intensity of competition between the merging parties, and “to assess whether the market shares of the merging parties overestimate or underestimate their market power”,<sup>215</sup> the Commission undertook an in-depth analysis of bidding in these markets. This analysis aimed, according to the Commission, to:<sup>216</sup>

- (1) Scrutinise the frequency of encounters of the various market players.
- (2) Analyse the closeness of substitution in a differentiated product market competition.
- (3) Determine the possible price impact of the proposed operation.

With regard to perioperative patient monitors, for instance, bidding data reflected that at EEA level, the merging parties encountered each other in 50-60% of the cases. In 20-30% of the tenders they faced no competition, and in a further 20-30% only one competitor. Moreover, in 30-40% of the cases the merging parties faced neither Siemens nor Philips (arguably their strongest competitors), but only various fringe market players, implying that the merger could have

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214 Case COMP/M.3083 GE/Instrumentarium, (2004) OJ L 109/1.

215 *Id.*, at para. 125.

216 *Id.*

reduced the number of significant players from two to one in every one out of three tenders.<sup>217</sup>

At a national level, results tended to differ among countries. In Germany, for example, GE and Instrumentarium met in 70-80% of all tenders. Furthermore, they encountered no further competition in 40-50% of these tenders. When they did face competition, it was typically a fringe player, thus neither Siemens nor Philips. Data from Spain and France confirmed that GE provided a main source of competition for Instrumentarium, while in other countries their interactions were more occasional.<sup>218</sup>

In addition, the Commission considered an RBB Economics win/loss study based on 2000-2500 tenders between the years 1998-2003. The study focused on identifying the ‘runner-up’, namely the second-place bidder or closest competitor in each tender won by Instrumentarium. At EEA level, GE appeared to be the runner-up in 30-40% of all tenders won by Instrumentarium, Philips in 30-40% and Siemens in 10-20%. At the national level, data reflected that at least in France, Germany and Spain, GE competed more closely with Instrumentarium. Therefore, a reduction in the number of significant players in the market would have had the effect of considerably weakening head-to-head competition, and could have resulted in the merged entity’s ability to raise its price after the merger.<sup>219</sup>

Notably, the Commission also attempted to quantify the impact of the transaction on price throughout an econometric analysis performed on the set of bidding data collected from the parties and their competitors. In particular, it sought to identify the effect that the presence of Instrumentarium had on the price charged by GE to its customers, and vice versa.

The price impact was measured via the impact on the discounts proposed by the various competitors. In France, for example, the Commission found that the average discount offered by Draeger (GE’s distributor of patient monitors) was 5-10% higher when Instrumentarium was present in the tender. Likewise, GE’s discounts appeared to be 10-20% higher when facing only Instrumentarium, rather than Siemens or Philips.<sup>220</sup>

At EEA level, an econometric study submitted by NERA Economic Consulting established that Philips discounts were 5-10% lower when GE was the only competitor present, and 5-10% lower when only Instrumentarium was present, compared with tenders where both firms participated. Such a trend reconfirmed

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217 Id., at para. 133.

218 Id., at para. 136-141.

219 Id., at para. 142-147.

220 Id., at para. 172-174.

that post-merger, Philips was likely to offer lower discounts, as a result of the elimination of a significant competitive constraint.<sup>221</sup>

Empirical findings in this case and bidding studies in particular, together with other qualitative evidence, supported the conclusion that the merger operation would remove the important competitive constraint that the parties imposed on each other with respect to perioperative patient monitors, and would create a dominant position, significantly impeding effective competition in 5 EU countries. Thus, in order to clear the merger, the parties were required to accept a number of commitments,<sup>222</sup> which were meant to preserve the competitive conditions in this market segment.

#### **4.12 A Simulation Approach to Mergers**

Most methods discussed in this chapter are carried out with the aim of aiding the market definition exercise, by providing information relevant to establishing market boundaries. However, recognising the limitations of the traditional analysis and the volatility of market definitions, resulting in part from varying degrees of court expertise and litigating parties' persuasive power, a growing trend in U.S. antitrust policy represents a shift away from structural analysis in both merger and non-merger investigations. Current U.S. antitrust policy is increasingly receptive to theoretical developments in economics, in particular the analysis of oligopoly behaviour and the role of efficiencies. This evolution has led to the latest revision of the U.S. Merger Guidelines<sup>223</sup> and to practical changes in antitrust enforcement. Nowadays, the prevailing wisdom focuses on analyses that prove market power directly, based on actual or potential harm to competition, rather than on market structure. Findings of such direct detrimental effects obviate the need for a meticulous market definition, in favour of verified evidence on the anticompetitive outcomes resulting from the conduct at hand.<sup>224</sup>

Particularly in the field of merger control, recent advancements in economic theory enable a competitive assessment that is detached from any ultimate conclusion concerning the question of the relevant market. Such an alternative to

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221 *Id.*, at para. 176-183.

222 *Id.*, at para. 321-358.

223 1997 revision of § 4, dealing with efficiencies.

224 For a general overview on this emergence in FTC policy see J.A. Keyte and N.R. Stoll, *Markets? We Don't Need No Stinking Markets! The FTC and Market Definition*, 49 *Antitrust Bulletin* 593 (2004).

market definition is provided by merger simulation models.<sup>225</sup> These arguably allow a ‘straight to the point’ analysis by directly estimating the effect a merger will have on the prices in the market, bypassing the need for a protracted account of firms being in and outside provisional market boundaries.

Merger simulation models analyse unilateral effects, i.e. post-merger ‘unilateral’ (non-collusive) price increases, which commonly arise in mergers in differentiated products markets.<sup>226</sup> As already highlighted earlier, mergers often reduce the number of competitors and the degree of ‘head-to-head’ competition between substitutes. A unilateral price increase may become profitable if a substantial number of customers who previously would have been lost to competitors can now be recaptured by the merged entity.

Consider, for example, an increase in the price of a product X. Such a price increase would be unprofitable for the producer of X if a sufficiently large number of (so-called marginal) consumers would switch from X, so that the loss in sales would outweigh the extra profit from the units sold. Moreover, the constraining influence of market participants is stronger the closer the substitutes for product X are (i.e. the higher the cross-price elasticity of demand between X and other brands in the market is). In markets with highly differentiated goods, a small increase in the price of X is enough to drive consumers towards their second-best choices. If, however, the producer of X contemplates a merger with a producer of another product Y, the merged firm might be able to increase prices while retaining any significant loss in sales, since it would now provide consumers with both their first and second choices. In this respect, merger investigations often raise the concern that effective competition in the market would be impeded.

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225 G.J. Werden, *Simulating the Effects of Differentiated Products Mergers: A Practitioners’ Guide*, Department of Resource Economics, University of Massachusetts (1997); G. J. Werden, *Product Differentiation: Simulating the Effects of Differentiated Products Mergers: A Practical Alternative to Structural Merger Policy*, 5 *George Mason Law Review* 363 (1997); R.J. Epstein and D.L. Rubinfeld, *Merger Simulation: A Simplified Approach with New Applications*, 69 *Antitrust Law Journal* 883 (2002); Bishop and Walker (2002), *op. cit.*, at 364-370; M.S. Becker, L. Froeb, D.T. Scheffman and G.J. Werden, *Whither Merger Simulation? The Antitrust Source* (May 2004); L. Wu, NERA Economic Consulting, *Unilateral Effects and Merger Simulation: The Devil Is in The Details, Competition Policy Insights* (January/February 2003); RBB, *The Emperor’s New Clothes? – The Role of Merger Simulation Models*, Brief 12 (January 2004).

226 *Guidelines on the Assessment of Horizontal Mergers under the Council Regulation on the Control of Concentrations between Undertakings*, OJ C 31/5 (2004), at para. 22(a). The Guidelines use the term ‘non-coordinated effects’ rather than unilateral effects. For further discussion see S.B. Volcker, *Mind the Gap: Unilateral Effects Analysis Arrives in EC Merger Control*, 25 *European Competition Law Review* 395 (2004).

The aim of simulation models is to predict the effect a merger might have on prices. Hence, their primary concern is not the possible creation of a dominant position after the merger, the crucial focus of the structural analysis, but the actual potential harm a merger might inflict on competition in the market.

A simulation exercise is typically carried out by utilising pre-merger market factors – prevailing prices and marginal costs together with estimated elasticities of demand – in an economic model that anticipates the interaction between the firms. By calculating the joint profit-maximising price and output for the merging parties, the models are able to generate post-merger price and profits predictions, which allow an assessment of the merger effect on competition. Moreover, the models examine further market reactions to the price increase, because such a price increase is expected to boost demand for competing suppliers' products, thereby encouraging them to also raise price until a new post-merger equilibrium is reached.

An additional contribution of these models concerns transaction synergies, namely merger-specific efficiencies such as marginal-cost reductions, and their potential to positively affect prices and consumer welfare. Consequently, merger simulation can compliment the existing structural approach to mergers resting on market definition and market-share-based presumptions of illegality, which only offer an imperfect indication to the intensity of competition.

A good illustration for the merits of this approach is found in the 1996 *Staples/Office Depot*<sup>227</sup> merger. As already stated, Staples and Office Depot were two of the three leading superstore chains, selling consumable office supplies in metropolitan areas of the U.S. The defendants argued that the appropriate product market was the overall sale of office products, of which the combined Staples/Office Depot accounted for 5.5% of total sales in North America. The trial court sided, however, with the FTC and established that the sale of consumable office supplies through office supply superstores was the appropriate relevant product market.

Econometric evidence played a key role in predicting the merger's impact on the market. In particular, both parties presented statistic and econometric studies to assess the potential effects of the merger on prices. Initially, the defendants purported to show that the merger would result in a mere 1% increase, compared with the 7% prediction generated by the FTC. Nonetheless, the FTC was able to refute their analysis and to show that it suffered from inherent economic flaws. Once the defendant's model was corrected, the prediction had to be adjusted to 7-9%, similar to the FTC figure.

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227 Federal Trade Commission v. Staples, Inc., 970 F. Supp. 1066 (D.D.C. 1997). See the case discussion at Baker (1997), *op. cit.*, and Ashenfelter et al. (2004), *op. cit.*



In conjunction with data on the pricing strategies of the merging firms, discussed earlier in the context of price-concentration analysis, the cumulative weight of empirical evidence in this case seemed to have greatly influenced the court in its decision. It affirmed both the narrower market definition presented by the FTC, and the theory of competitive harm resulting from mergers among sellers of close substitutes.<sup>228</sup>

The Staples/Office Depot merger demonstrates the potential uses of the simulation approach to mergers. By providing systematic empirical evidence on industry pricing to support the theory suggested by the documentary evidence, the FTC was able to contest the defendants' otherwise natural presumption of being minor players in a broad office-supply retailing product market, and reveal the true nature of the interaction between them. Merger simulation provided a powerful tool in this process, affording the court sufficient ground to grant an injunction.

Nonetheless, it is important to note that the court in the Office Depot case did not relinquish market definition in favour of an exclusive effect-based approach, nor did it refrain from using structural indicators, in particular references to market shares and HHIs. Instead, the quantitative evidence in this case accompanied the traditional considerations in conclusively establishing that the merger between Staples and Office Depot might substantially lessen competition.

#### 4.12.1 Technicalities of Merger Simulation

Merger simulation models range in their degree of sophistication. However, all models utilise pre-merger market data together with certain assumptions regarding the behaviour of the firms, to generate values for post-merger price and output.<sup>229</sup> In this process, prices, costs and demand elasticities (own-price and cross-price) are used as inputs, and are hence pre-determined. Employing the standard economic assumption of profit maximisation, those factors are then employed to calculate pre-transaction margins for each relevant brand. Assuming further that the merged entity seeks maximisation of the joint profits, the models generate predictions of the post-merger prices, margins, profits and consumer welfare.

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228 Note that the court did not explicitly use the unilateral effect theory, and instead reverted to the old 'practical indicia' to support its reasoning. It did recognise, however, the threat resulting from the elimination of a main source of competition in the market, as articulated in § 2.2 of the U.S. Merger Guidelines.

229 Werden (1997), *op. cit.*, at 374-377; Epstein and Rubinfeld (2002), *op. cit.*, at 886-887.

It is therefore customary for a simulation process to take the following form.<sup>230</sup> During the first stage, the model is ‘calibrated’, that is, parameter values are chosen to fit the specific features of the industry. This includes a determination of the magnitude of prices, shares and the elasticities of demand. Typically, the prevailing prices and shares are taken to represent market equilibrium ‘but for’ the proposed merger. Demand elasticities are estimated econometrically whenever possible, using high frequency scanner data. When an econometric estimation is not feasible, the estimation of elasticities is based on market observations, i.e. surveys, marketing studies and any other documentation of consumers’ preferences and switching patterns.<sup>231</sup> Moreover, the figures collected above are used to determine the margins for all the products included in the simulation.

During the second stage, the model simulates a post-merger price increase, and confronts the result with the prices used in the calibration. The difference between the two can generally be attributed to the effect of the merger, and indicates whether the merger is expected to allow the merging firms the power to act unilaterally.

Implementation of this analysis requires that several key assumptions be made. To begin with, the simulation exercise requires making an assumption about the nature of oligopolistic competition in the market. Models typically presume that firms compete in a Bertrand competition, by which each firm sets the prices of its brands to maximise its profit, while considering any possible strategic reactions of its competitors. The outcome of this competitive interaction is a Nash non-cooperative equilibrium, implying that no competitor has an incentive to change its strategy (i.e. pricing decision) given the strategies taken by its rivals.<sup>232</sup> Moreover, simulation models necessitate a strong assumption concerning the structural form of consumer demand, namely the shape of the demand curve, specifying the relationship between prices charged and quantities sold for the products of interest. Most commonly applied models are log-linear, linear, logit and AIDS.<sup>233</sup> Using the chosen demand model enables a particular estimation

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230 G.J. Werden, L.M. Froeb and D.T. Scheffman, A Daubert Discipline for Merger Simulation, Federal Trade Commission, Bureau of Economics (February 16, 2004).

231 C. Meyer, NERA Economic Consulting, Designing and Using Surveys to Define Relevant Markets, Antitrust Insights (October-December 2006).

232 For a basic introduction to the notions of ‘Nash equilibrium’ and ‘Bertrand competition’, see Pindyck and Rubinfeld (2005), *op. cit.*, at 442, 449-450.

233 The latter models are addressed formerly in this chapter. For an introductory review see M. Conti, EU Merger Analysis, Merger Simulation Models in the Context of the Merger Regulation, Competition Law Insight (May 2006). A much broader and comprehensive representation is found at R.J. Epstein and D.L. Rubinfeld, Technical Report for DG Competition, Effects of Mergers Involving Differentiated Products, COMP/B1/2003/07 (2004).

of the relevant own-price and cross-price demand elasticities. However, any assumption made about how elasticities vary as prices rise may also change the predicted post-merger price rise, affecting accuracy of the model predictions.<sup>234</sup> Finally, an assumption concerning the form of the marginal costs curve has to be made, in order to assess how total costs respond to changes in output post-merger. It is common to assume that the latter do not vary throughout the relevant range.<sup>235</sup>

Merger simulation models mainly differ in the structural assumptions they impose, in order to limit the need to estimate multiple own-price and cross-price elasticities. In general, the fewer restrictions a model places on substitution possibilities between different brands, the more reliable its predictions are likely to be. However, accounting for all possible cross-price elasticities is often impractical, as it necessitates immense data and estimations of too many parameters. The trade-off is hence between accuracy and workability of the model.

One simulation technique that gained popularity in antitrust analysis is the PCAIDS model, or Proportionality Calibrated AIDS,<sup>236</sup> which only requires limited information, i.e. market shares, the industry price elasticity, and the price elasticity for one brand in the market. Market shares can be observed at the industry level,<sup>237</sup> whereas elasticities can be econometrically estimated when data permits<sup>238</sup> or obtained from marketing information.<sup>239</sup>

In the first stage, the model generates a set of mathematical first order conditions, resting on the assumption of pre-transaction profit maximisation. Those conditions are used to calculate pre-merger profit margins for each brand. In the second stage, the model takes into account that a post-merger price increase is anticipated, as the merger removes a currently valid competitive constraint from the market. In applying its new profit maximisation strategy, the merged firms consider the profits regained from diverting customers' purchases to the brand of its merging partner. Hence, the demand model applies a profit-maximising condition to the sum of profits from all the brands that are now sold under the

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234 Crooke et al. (1999), *op. cit.*, show that on average, predicted post-merger price rises are three times larger for log-linear versus linear, two times larger for AIDS versus linear, and 50% larger for logit versus linear.

235 Werden et al. (2004), *op. cit.*, at 12.

236 Advocated by Epstein and Rubinfeld (2002), *op. cit.*

237 Note that a market definition process is required to calculate those market shares, although no specific line-drawing is needed, because what matters is relative outputs of the leading brands. See Werden (1997), *op. cit.*, at footnote 59.

238 Complications related to econometric estimations of demand elasticities were discussed in length earlier in this chapter.

239 Simulation models can test the sensitivity of the results to changes in the values of the estimated elasticity parameters. This may be informative in the latter cases.

merged entity. It further translates the expected price changes into new margins, elasticities and market shares.

More specifically, PCAIDS expands upon the widely accepted economic model AIDS ('Almost Ideal Demand System'), which is arguably too complicated to serve a demand model for merger simulations.<sup>240</sup> PCAIDS offers a presumably more reasonable alternative when data is limited, as is often the case. The basic idea behind its methodology is to reduce the number of variables in the model. This is done by introducing a proportionality assumption into the analysis, which holds that if one firm raises its price, it loses demand to other brands in proportion to their respective market shares. For example, if the model consists of three firms A, B and C with 20%, 40% and 40% market shares respectively, the portion of sales lost by the A brand will be allocated between brands B and C in a ratio of 40:40, or in other words equally.

The proportionality assumption may, however, come at a high price. If products are highly differentiated, the model cannot always capture the diversion of lost sales accurately. When, for instance, the products of the merging firms are relatively more similar in their attributes to one another than to other products in the relevant market, market shares may understate the competitive effect of concern.<sup>241</sup>

Oversimplification of market realities in this model can be somewhat alleviated when introducing 'nests' into the demand assumptions.<sup>242</sup> The nests group together products that are closer substitutes for each other than proportionality suggests. For example, in a merger in the breakfast-cereals sector, children's cereals such as Coco Pops and Frosties would be placed in a nest, recognising that these brands compete more directly with one another than they do with Fruit 'n Fibre or All Bran. Information on diversion ratios between brands will assist in establishing the proportions in which demand shifts away from Coco Pops to Frosties or All Bran, needed to construct the nest. This partition enables focusing on substitution within a particular nest, if not across different nests.

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240 Among some of its impracticalities are the need to econometrically estimate a large number of parameters, the reliance on scanner data that is typically available for supermarket brands rather than small outlets sales, and the requirement that market shares sum to 100%. The PCAIDS simplifies the simulation process by assuming, among others, that the shares of the market players under study sum up to 100%, and by suggesting (absent independent information about the magnitude of that elasticity)  $-1$  as a good starting point for industry elasticity.

241 RBB (2004), *op. cit.*

242 R. J. Epstein and Daniel L. Rubinfeld, *Merger Simulation with Brand-Level Margin Data: Extending PCAIDS with Nests*, 4 *Advances in Economic Analysis & Policy*, Article 2 (2004).

An arguably superior class of models can be implemented with better data availability that will allow inclusion of the individual demand elasticities into the model. As a preliminary step, this requires that demand elasticities of each brand be estimated econometrically. Furthermore, the estimated elasticities are used to simulate the effect of a merger. Such an approach demands considerable information, but at the same time diminishes the need to rely on market definition, since the closeness between brands (expressed in terms of cross-price demand elasticities) is an endogenous part of the model.<sup>243</sup>

#### 4.12.2 Implementing Merger Simulation in Competition Law Analysis

##### *Volvo/Scania*<sup>244</sup>

A rather sophisticated simulation analysis was undertaken in the Volvo/Scania case, a merger concerning heavy trucks that was blocked by the European Commission. The large market shares of the merging parties jointly, ranging in the relevant countries from 49% to 91%,<sup>245</sup> coupled with considerations of strong brand loyalty, low consumer buying power and high entry costs, justified in the Commission's view declaring the merger incompatible. Although the decision ultimately rested on conventional structural merger analysis, a simulation exercise was commissioned for this case in order to assess the economic consequences of the transaction.<sup>246</sup>

The simulation was carried out using a so-called nested logit model, which presupposed geographically segmented markets and product differentiation in two nests (i.e. product market segments): rigid trucks and tractor trucks. Using data from 16 EEA countries over the years 1997-1998, the model confirmed that Volvo and Scania closely competed in the two market segments, whereas other heavy trucks produced by rival suppliers were considered weaker substitutes. In particular, the simulation model predicted the following post-merger percent price increases:<sup>247</sup>

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243 RBB (2004), op. cit.

244 Case Comp/M.1672 Volvo/Scania, (2001) OJ L 143/74.

245 The Commission focused on heavy trucks segments in Sweden, Norway, Finland, Ireland and Denmark only. In all five countries, the merger operation would have created a dominant position on a national market definition.

246 The simulation was implemented by M. Ivaldi and F. Verboven, *Quantifying the Effects from Horizontal Mergers in European Competition Policy* (September 2002). Available at: [http://www.idei.fr/doc/by/ivaldi/iv\\_merger\\_v04.pdf](http://www.idei.fr/doc/by/ivaldi/iv_merger_v04.pdf), though not explicitly referred to by the Commission. See also M. Ivaldi and F. Verboven, *Quantifying the Effects from Horizontal Mergers in European Competition Policy*, 23 *International Journal of Industrial Organization* 669 (2005).

247 The information is taken from Ivaldi and Verboven (2002), op. cit., at Table 5.

**Table 7.** Simulated Post-Merger Price Increases

	Volvo/Scania		Competitors	
	Rigid	Tractor	Rigid	Tractor
Denmark	11.55	8.17	0.26	0.19
Finland	10.03	7.83	0.39	0.24
Ireland	10.87	7.36	0.21	0.30
Norway	13.17	8.63	0.32	0.28
Sweden	22.34	12.64	0.47	0.32

The table clearly illustrates that potential price increases by the merging parties were significantly greater than any increases attempted by competitors in these markets. The simulation exercise therefore reinforced the conclusion – based on market shares analysis – reached by the Commission.

In addition, the simulation model examined the potential effect of merger-specific efficiencies on the relevant markets. In the first scenario, the model assumed that the merger would not result in any cost savings. As prices were expected to rise by more than 10% in all countries under investigation, the decline in consumer welfare was estimated to be greater than 10% in two of the five relevant countries, and greater than 5% in the others.<sup>248</sup> In the second scenario, the merger would hypothetically generate marginal cost savings of 5%. Such efficiencies, however, as the model showed, could not be translated into an increase in consumer welfare in the five countries considered by the Commission.<sup>249</sup>

As this case demonstrates, the simulation approach to mergers is undoubtedly able to contribute useful information to depict the post-merger behaviour of the firms involved. Nonetheless, it should not be forgotten that simulation models, as any economic model, may be controversial, and their results debatable. For example, in the *Oracle/PeopleSoft*<sup>250</sup> merger, the parties argued that the Com-

248 Ivaldi and Verboven (2005), op. cit., at Table 5.

249 In fact of all 16 countries analysed in the model, those five countries exhibit the strongest fall in consumer welfare. See Ivaldi and Verboven (2005), op. cit., at Table 5.

250 Case COMP/M.3216 Oracle/PeopleSoft, (2005) OJ L 218/6. For further discussion of the EU case and its U.S. counterpart see M. Pflans, *Oracle/PeopleSoft: The Economics of the EC Review*, 26 *European Competition Law Review* 123 (2005); O. Budzinski and A. Christiansen, *The Oracle/PeopleSoft Case: Unilateral Effects, Simulation Models and Econometrics in Contemporary Merger*

mission's simulation model – postulating that the merger was likely to lead to significant harm to consumers – could only be viewed as a crude indication rather than solid evidence, due to the inevitable need to make simplifying assumptions. To that, the Commission decisively responded:<sup>251</sup>

“The Commission agrees that the use of simulation models depends critically on the ability of the model to adequately capture the fundamental mechanisms that drive the behaviour of the different market participants and that, in principle, the assessment as to whether that is the case in any particular case may be a subject of debate. For models to be mathematically tractable it is necessary to make simplifying assumptions and in this process it is important to ensure that the essential mechanisms that are left in the model adequately reflect the reality.

But the debate over which simplifications to accept in the model should not obscure the fact that any prospective analysis of the effect of a merger will inherently be based on assumptions. A prediction of the effect of a merger made within the framework of a model is based on a high degree of transparency regarding the logical consistency of the prediction as well as its underlying assumptions. A prospective analysis made outside the framework of an economic model based on qualitative assessment is equally, though in a less transparent and implicit way, based on a number of assumptions and may therefore equally be subject to the same kinds of criticisms.

The Commission therefore maintains as a general point that this kind of simulation model can be a useful tool in assisting the Commission in making the economic assessment of the likely impact of a merger”.

Models can be attacked on the grounds of the data used, the appropriate application of the methodology, and the degree of plausibility of the econometric analysis. The Volvo/Scania conclusions discussed above were heavily criticised by the merging parties, who mainly argued against the chosen econometric estimation procedure, and the use of list prices data versus actual transaction (discounted) prices.

The choice of technical parameters, e.g. the assumed shape of the demand curve (linear or convex) and the marginal cost curve, the economic theory underlying the interaction between the firms, and the preference of a certain type of model over another, may have a key role in the simulation results. Users of these models should also bear in mind that simulation models can hardly capture the dynamic realities of real-life markets to a full extent. They do not

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Control, Marburg Papers on Economics No. 02-2007 (2007) (forthcoming in 34 *Legal Issues of Economic Integration*).

251 Case COMP/M.3216 Oracle/PeopleSoft, (2005) OJ L 218/6, at para. 193-195.

account, for instance, for barriers to entry or expansion, the possibility of new brands emerging into the market as a response to the merger, or for changes in buying practices motivated by the merger. Neither do they take account of the potential for post-merger coordination, nor elements of non-price competition.

Finally, as with all quantitative tools, simulation models are constrained by the robustness of the data used, and its availability. Consequently, in Volvo/Scania, as in most cases, simulation exercises were only convincing when their assumptions fit the facts of the industry, and when their findings could be verified against the conclusions of the structural analysis.<sup>252</sup>

So far, courts have not replaced the traditional methodology, and simulation techniques have been used to accompany and enforce the conventional merger analysis. In this process, market definition still occupies a primary position, either in launching the investigation and focusing the discussion on the relevant players, or in providing the necessary market share data for conducting a simulation model. As rightly noted by Mike Walker, vice president of Charles River Associates in London, merger simulation can only form a part of the information matrix.<sup>253</sup>

“A common claim is that merger simulation allows one to dispense with market definition and competitive effects analysis and instead go straight to the answer, but merger simulations omit important factors ... they can add confidence to the results of the competitive effects analysis, but are not a substitute for the competitive effects analysis”.

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252 Werden et al. (2004), *op. cit.*, suggest the Daubert discipline for merger simulation. Following the important U.S. Supreme Court precedent in *Daubert v. Merrell Dow Pharmaceuticals Inc*, 509 U.S. 579 (1993), which established the conditions for courtroom admissibility of expert testimony, the authors identify and discuss three requirements for the validity of merger simulation predictions: (1) The simulation must be conducted by someone with expertise in structural modeling of real-world industries and the underlying economic theory. (2) The economic model employed in the simulation, and any estimation methods used to calibrate those models, must be considered sound within the relevant fields of economics. (3) The simulation model must reasonably fit the facts of the case. In line with that critique, a recent misuse of the merger simulation approach was arguably conducted by the UK Competition Commission in its investigation of *Somerfield/Morrisons* acquisition. See RBB Economics, *Lost in Translation: The Use and Abuse of Diversion Ratios in Unilateral Effects Analysis*, Brief 19 (June 2006).

253 Quoted in L. Hutchinson, *EC Increasingly Using Merger Simulation Techniques in Antitrust Probes*, Editorial, *mergermarket* (Brussels, 31 January 2005). See also J.F. Rill, *Practicing What They Preach: One Lawyer's View of Econometric Models in Differentiated Products Mergers*, 5 *George Mason Law Review* 393 (1997), maintaining at 393: “While the development of price-simulation models suggests an advancement in thinking about differentiated products cases, these models do not compel the abandonment of the traditional market definition approach ...”; L.M. Froeb, *Unilateral Merger Effects & Economic Models*, Presented in the 2004 Antitrust Conference: *Antitrust Issues in Today's Economy*, New-York (March 2004); M. Walker, *The Potential for Significant Inaccuracies in Merger Simulation Models*, 1 *Journal of Competition Law and Economics* 473 (2005).



## Chapter 5

# Cases

### 5.1 Introduction

Market definition in European competition law proceedings tends to be a necessary prerequisite for any competitive assessment. It is typically the central focus of any investigation, both in terms of the amount of length of discussion devoted to it, and in the volume of economic analysis and empirical evidence presented.

The 1997 Notice on the definition of the relevant market,<sup>1</sup> promulgating the U.S.-based SSNIP test approach,<sup>2</sup> was considered in many respects to be a major breakthrough for economic analysis in market definition. With its promulgation, the European Commission's Competition Directorate was thought to signal its entry into the world of sophisticated competition law enforcement. Clearly expressing the economic criteria for market definition, and specifying the techniques that should be utilised to implement the market delineation process, the Notice was seen as a decisive step towards accuracy in competition analysis, predictability in judicial review, and conformity with international standards.<sup>3</sup> Alongside this, a relevant antitrust market according to the European Commission was made formally equivalent to its U.S. counterpart,<sup>4</sup> with regards close substitutability as the yardstick for market definition, and gauged with the aid of the SSNIP (or the hypothetical monopolist) paradigm.

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1 Commission Notice on the Definition of the Relevant Market for the Purposes of Community Competition Law, OJ C 372/5 (1997) (hereinafter: "1997 Notice").

2 U.S. Department of Justice and the Federal Trade Commission Horizontal Merger Guidelines, 57 Fed. Reg. 41552, reprinted in 4 Trade Reg. Rep. (CCH), 104 (1992, revised April 1997) (hereinafter: "U.S. Horizontal Merger Guidelines").

3 CRA International, The Modernisation of DGIV, Competition Memo (June 1997); B. Bishop, The Modernisation of DGIV, Editorial, 8 European Competition Law Review 481 (1997); S. Baker and L. Wu, Applying the Market Definition Guidelines of the European Commission, 19 European Competition Law Review 273 (1998); P. Crocioni, The Hypothetical Monopolist Test: What It Can and Cannot Tell You, 23 European Competition Law Review 354 (2002); K.S. Desai, Limitations on the Use of Economic Analysis in E.C. Competition Law Proceedings: Part I, 23 European Competition Law Review 524 (2002).

4 Note that whilst in the U.S. the SSNIP methodology is principally aimed at the analysis of mergers (i.e. it is incorporated into the U.S. Horizontal Merger Guidelines), in Europe it applies generally to both merger and non-merger transactions.

In practice, however, though effectively the leading market definition methodology in Europe, the promise enveloped in the Notice's SSNIP test did not fully materialise. The importance attached to this exercise has weakened rapidly as it has become increasingly evident that the Commission does not routinely apply the test, and perceives it as only one possible method for market definition rather than the central concern. In the recent case of *Virgin/British Airways*, for example, the Commission de-emphasised the importance of the SSNIP test, and resorted to the traditional approach focusing on product characteristics:<sup>5</sup>

“The Notice describes how the Commission uses information about product characteristics, evidence of past substitution and so forth to define a product market. The Notice mentions the idea of a hypothetical price rise but does so to explain the concept of a relevant market”.

Moreover, although the Notice considers the SSNIP methodology for both product and geographic relevant markets, in practice the test's implementation (whether explicit or implicit) is much more apparent and better structured in product market definition exercises. Many geographic market definitions are made on the basis of homogeneity of the competitive conditions,<sup>6</sup> rather than on a strict application of the SSNIP, in a fashion resembling the ‘product characteristics’ approach to product markets.<sup>7</sup> It also seems to be the case that the Commission attaches more weight to demand-side substitution than to supply-side substitution when defining the market, though the latter should be equally considered according to Notice's formulation.<sup>8</sup>

5 Case IV/D-2/34.780 *Virgin/British Airways*, (2000) OJ L 301/1, at para. 70.

6 C. Bellamy and G. Child, *European Community Law of Competition*, Sweet and Maxwell (5<sup>th</sup> ed., 2001), at 395, 698-702; A. Jones and B. Sufrin, *EC Competition Law* (2<sup>nd</sup> ed., 2004), maintaining at 68-70: “the Community authorities’ approach to the geographic market has often been criticized for failing to give sufficient attention to substitutability between different geographic areas. As in the case of the product market the geographic market has often been drawn narrowly”.

7 L. Coppi and M. Walker, *Substantial Convergence or Parallel Paths? Similarities and Differences in the Economic Analysis of Horizontal Mergers in U.S. and EU Competition Law*, 49 *Antitrust Bulletin* 101 (2004), at 104, 109-110.

8 Copenhagen Economics, *The Internal Market and the Relevant Geographic Market*, Report prepared for the European Commission (February 3, 2003). In their report, the authors compared the methodology for geographic market definition to product market definition, between the years 1990-2001. A sample of 67 Phase II merger cases (about 70% of all such cases) generated the following results:

	<b>Geographic market (% of markets defined)</b>	<b>Product market (% of markets defined)</b>
SSNIP – method	4	11
Demand substitution	5	66
Supply substitution	6	22
Potential supply	1	15

An additional concern relates to the economic inputs in European competition law cases. Whilst the 1997 Notice may have attempted to posit economic analysis as the hallmark of market definition, many cases are defined in terms susceptible to subjective considerations and imprecise measures. A partial justification may come from the reduced availability of high-quality data compared to the U.S. (indeed most of the economic evidence brought before the Commission is initiated by the parties, typically in their favour), but probably more profoundly this tendency may be rooted in the insufficient economic ‘tradition’ of EU competition law practice. As recently stated by some commentators, “EU competition policy has only recently begun to interact more heavily with economic theory; a process that goes back a long way in the U.S.”<sup>9</sup> This is best reflected in observing the differences in empirical techniques utilised by the EU and U.S. antitrust authorities. Sophisticated econometric techniques, such as estimation of demand systems or merger simulations are far more prevalent in the U.S. than in the EU. Even the more readily conceivable critical loss analysis is seldom invoked, despite its popularity in the U.S.;<sup>10</sup> The EU opts in exchange for more intuitive instruments such as price correlation and cointegration analysis, trade flows and transport costs, which do not necessitate particular economic expertise. Nonetheless, as explained in the previous chapter of this book, demand analysis would better promote an application of the SSNIP test which is in harmony with economic theory.

As a result, the Commission’s market definition analysis generally falls short of the rigorous empirical approach conveyed by the SSNIP methodology. In fact in many cases, the question of the ability of an undertaking or a group of undertakings to profitably raise prices above the competitive level is not even asked. Rather, the assessment is highly qualitative, mainly featuring informal factors such as interchangeability in use, common characteristics, customer groups, local preferences or absolute price comparisons.<sup>11</sup>

This chapter poses the question whether the European Commission’s practice, as reflected in its decisions, constitutes a decision-making process that is in conformity with the economic insights drawn in the previous chapters. In order to test the full impact of the economic approach, a distinct analysis of selected Commission decisions is undertaken, to assess whether the Commission’s

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9 G. Niels and A. Ten Kate, Introduction: Antitrust in the U.S. and the EU – Converging or Diverging Paths?, 49 Antitrust Bulletin 1, 16 (2004).

10 Coppi and Walker (2004), *op. cit.*, at 108-109.

11 C. Veljanovski, EC Merger Policy after GE/Honeywell and Airtours, 49 Antitrust Bulletin 153, 167 (2004).

market definitions exhibit sound economic reasoning. An additional question addressed here, in comparing recent decisions to older ones, is whether the 1997 Notice on the definition of the relevant market has signified a genuine change in the Commission's approach, compared to its older 'traditional' practice.

The cases are presented in a chronological order, to allow a clear demonstration of the Commission's approach to market definition. Each case is first reviewed for its facts and judgement, and proceeds to critically assess the definition of the relevant market as well as the reasoning and methods applied by the Commission in that process.

Interestingly, in spite of the often-heard claim that European competition law has become more economics-oriented, many of the cases discussed below are missing from standard legal textbooks, or appear in a purely legal context. The *United Brands* case, for example, is often cited in the context of dominance, due to the detailed attention paid to the definition of this concept by the Court of Justice there.<sup>12</sup> Issues of dominance were also dealt with in the *Nestlé/Perrier* decision, affording this case a role in many textbooks.<sup>13</sup> Nonetheless, legal textbooks typically abstain from inferring the economic merits of cases, and as quantitative analysis is sometimes perceived outside the scope of legal practice, references to the cases addressed below are generally hard to find. On the other hand, economic textbooks often devote too little attention to the legal and institutional framework, and the limitations they impose on economic analysis.

As a final observation, the cases chosen underline different quantitative techniques and exemplify the various ways in which economic analysis can contribute to the assessment. As such, they do not necessarily typify the Commission's practice, but rather indicate the potential uses and misuses of empirical methods in aiding market definition.

## 5.2 United Brands<sup>14</sup>

### 5.2.1 Facts and Judgement

United Brands against the Commission, better known as the Chiquita banana case, marks the early days of market definition and market power in the European Commission's practice. Viewed retrospectively, the decision is thought to reflect

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12 For example. D.G. Goyder, *EC Competition Law*, Oxford (4<sup>th</sup> ed., 2003), at 272; V. Korah, *An Introductory Guide to EC Law and Practice*, Hart (8<sup>th</sup> ed., 2004), at 94; M. M. Dabbah, *EC and UK Competition Law*, Cambridge University Press (2004), at 329; J. Faull and A. Nikpay, *The EC Law of Competition*, Oxford (1999), at 123. *United Brands* is also a typical tenant in 'excessive pricing', 'refusal to deal' and 'price discrimination' discussions.

13 E.g. Faull and Nikpay (1999), *op. cit.*, at 248; Goyder (2003), *op. cit.*, at 365.

14 Case 27/76 *United Brands v. Commission*, (1978) ECR 207.

the risks associated with arbitrary market definitions, based upon subjective evaluation criteria and contingent upon the analyst's personal viewpoint. The applicants, U.S.-based United Brands Company and its Dutch representative United Brands Continental, were found guilty by the Commission of infringing Article 86 EC (nowadays Article 82) due to the marketing of bananas grown and imported by them (known as Chiquita bananas). In particular, United Brands liability was based on the following conduct:<sup>15</sup>

- (1) United Brands required its distributors/ripeners in Belgium, Luxemburg, The Netherlands, Denmark, Germany and Ireland to refrain from selling its bananas while still green.
- (2) United Brands charged distributors/ripeners in countries other than the ones listed above dissimilar prices for the sales of its bananas.
- (3) United Brands imposed unfair prices for the sales of Chiquita bananas on its customers in Belgium, Luxemburg, The Netherlands, Denmark and Germany.
- (4) United Brands refused to supply Chiquita bananas to the Denmark based distributor Olesen, between October 1973 and February 1975.

In order to determine whether United Brands was abusing its market position, and following the condition set in Article 86 EC, the European Court of Justice (ECJ) was first required to establish United Brands' dominant position.<sup>16</sup> This could only exist in relation to a relevant market on both product and geographic dimensions.

The geographic market adopted by the ECJ encompassed a substantial part of the Common Market, including Germany, Denmark, Ireland, The Netherlands, Belgium and Luxemburg, where the conditions of competition were said to be homogeneous.<sup>17</sup> The market definition excluded the other Member States of the Community, namely France, Italy and the United Kingdom, despite the presence of United Brands bananas there, since special import arrangements and trading conditions restricted the free sale of bananas in these countries.

A more perplexing issue was, however, introduced by the product market definition.<sup>18</sup> According to the ECJ, as far as the product market was concerned, the main question was whether United Brands' bananas were an integral part of a larger fresh fruit market that included, *inter alia*, apples, oranges, grapes and

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15 Id., at para. 3.

16 Id., at para 10.

17 Id., at para. 36-57.

18 Id., at para 12-35.

peaches, or whether bananas – both branded and unbranded – constituted a distinct relevant market.

As this case concerned an abuse of a dominant position, it basically hinged on the outcome of the market definition exercise. Delineating the market broadly, with bananas being one among many other fresh fruit, would posit United Brands as a minor player and thus undermine its alleged ability to affect market outcomes. A finding of a narrow market for bananas only, on the other hand, would imply a high market share – in the range of 40-45% – distinguishing United Brands as a potentially dominant firm and implying an unequivocal competitive advantage.

As to be expected, United Brands sided with a broad market definition. It asserted that bananas competed with other fresh fruit in the same shops, on the same shelves, at comparable prices, while satisfying the same needs of consumption, as a dessert or between meals.<sup>19</sup> It further produced statistics indicating that consumer expenditure on the purchase of bananas was lowest in the period between June to December, when the supply of fresh fruit on the market was abundant. Studies carried out by the Food and Agriculture Organization confirmed that bananas prices tended to decline during the summer months, and towards the end of the year, during the ‘orange season’. Moreover, in Germany, for example, the prices of apples were shown to have a statistically significant effect on the consumption of bananas.<sup>20</sup> This evidence corresponded with United Brands contention of being one among numerous competitors in the fresh fruit market, and its appeal to evaluate its conduct within that wider context.

The ECJ advocated, however, the opposite definition and maintained that a separate demand for bananas existed, distinct from the demand for other fresh fruit. In general, it abided by the view that the specific qualities of bananas rendered them unique to some consumers, and established a strong preference which could not be satisfied by other fruits. In particular, the ECJ set forth the following line of reasoning to support its view.<sup>21</sup>

- (1) Bananas are sufficiently differentiated from other fruits, and are therefore only interchangeable with them only to a very limited extent.
- (2) Bananas are ripened around an entire year, with no seasonality in production. Such throughout-the-year production always exceeds demand, and can satisfy it at any time. Due to this continuous nature of production,

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19 Id., at para. 13.

20 Id., at para. 15.

21 Id., at para. 22-35.

the supply of bananas can match any seasonal supply fluctuations of other fresh fruit, and can serve consumers needs all year round.

- (3) Since bananas are available throughout the year, the question whether they can be replaced by other fruits has to be answered whilst examining the entire year.
- (4) Price effects and influences reported in the studies quoted by United Brands are too brief and sporadic to prove that other fruits can be regarded as substitutes for bananas. The above studies do not exhibit any significant long-term cross-elasticity between bananas and other fruits. The flexible adjustment in the supply and pricing of bananas to the seasonal increase in supply of other fruits shows that the competition between them is limited. Specifically, the seasonal substitution that was observed between bananas and two other fruits – peaches and grapes – is limited and periodic. With respect to oranges and apples – fruits that are also available all-year-round – the court concluded that the former are not interchangeable and the latter are substitutes only to a very limited extent.
- (5) Bananas have certain characteristics: appearance, taste, softness, seedlessness, easy handling, and a constant level of production. Those enable it to satisfy the constant needs of an important section of the population: the very young, the old and the sick. Hence, for a very large group of consumers, the demand for bananas is fixed, and cannot be undermined by the appearance of other fresh fruit on the market.

### 5.2.2 Assessment of the Court Decision

The ‘banana’ case exemplifies how the result of the market definition exercise may differ according to the methodology used. With a seemingly predetermined banana market in mind, and based on its belief that the special characteristics of bananas are so unique that no other fruit could make out a meaningful substitute, the ECJs decision marks the conventional judicial approach to the problem of the relevant market, placing ultimate focus upon product features, function and intended use. Furthermore, the ECJs reasoning relies heavily on the fact that certain consumer segments – basically the ‘toothless’ and the ‘needy’ – perceive bananas as non-interchangeable, and could not be enticed by other fresh fruit that appear on the market occasionally. As specified by the court:<sup>22</sup>

“The banana has certain characteristics, appearance, taste, softness, seedlessness, easy handling, a constant level of production which enable it to satisfy the constant

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22 Id., at para. 31.

needs of an important section of the population consisting of the very young, the old and the sick”.

This, in the court’s view, justified a very narrow and exclusive market.<sup>23</sup> However, the pertinent question with regards the market definition exercise is not whether a certain group of consumers recognise the peculiarity of bananas compared to other fresh fruit, but whether a sufficiently large number of consumers would switch to alternative fruits upon an increase in the price of bananas. The strong preferences arguably held by the young, old or sick, do not necessitate that a small price increase would induce significant substitution.

From an economic point of view, delineating the market merely upon product characteristics carries the risk of generating biased definitions that are not grounded in market realities. As a general matter, the court invoked the notion of substitution repeatedly throughout its market definition analysis, but its reasoning in this respect was undermined by serious flaws. The court pointed to the fact that bananas were readily available all-year-round whereas other fresh fruit were introduced sporadically and at limited times of the year. This excluded, in the court’s view, any meaningful substitution between them. However, such an argument is unsubstantiated in terms of economic theory. Showing that product prices and quantities are intertwined throughout the entire year is irrelevant in attempting to prove substitution. It suffices to show that banana producers have to react in price and in quantity to the availability of other fruits on the market, to deduce that bananas do have substitutes in the eyes of consumers.

In this respect, the studies provided by United Brands ostensibly proved that substitution between bananas and other fruits was highly feasible. There was no reason for banana producers to lower prices in the summer season if they had not faced competition from other fruits abundant in that period. Maintaining high prices would imply a drop in bananas’ sales and revenues, as consumers were apparently ready to switch to alternative fruits. The fact that such a tendency was not observed all-year-round only reinforces that point even further. Recognising that fresh fruit is scarcer in the winter period, banana producers

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23 It is interesting to note that bananas’ exclusivity in terms of characteristics was undermined in a later judgement of the European Court of Justice, Case 184/85 *Commission v. Italian Republic*, (1987) ECR 2013. The court held, at para. 12, that although bananas and table fruit typically produced in Italy – e.g. apples, pears, peaches, plums, apricots, cherries, oranges and mandarins - were not similar products (i.e. bananas lacked any thirst-quenching properties), “bananas do afford an alternative choice to consumers of fruit. As a result, bananas must be regarded as being in partial competition with such fruit”. It should be recognised, however, that the case at hand did not concern the application of Article 82, but rather a prohibition of taxation provision.



could raise prices again to their higher level, as the competitive constraints in that period diminished.

The court's interpretation of the term cross-elasticity in this context was therefore incorrect. Cross-price elasticity between products does not exist as an absolute value, and is not necessarily long lasting. It is very reasonable that cross-price elasticity between bananas and peaches would be high in the summer months, when both fruits are sold in large numbers, and low in the winter months, when peaches are not as widely available and priced exceedingly high. It is exactly the fact that the price of bananas dropped in the summer that demonstrates (in the absence of any exogenous factors) that the cross-price elasticity during that period was significant, and implied that competition between those products actually took place.

As seasonality may have affected the product market in this case – since it might be harder for customers to substitute bananas in the winter period – it might have been appropriate to extend the product dimension and add a temporal dimension to the definition. This could have led to bananas forming a relevant market only at several months of the year.<sup>24</sup>

Moreover, as discussed at length in previous chapters of this book, the cross-price elasticity concept has a limited applicability on a stand-alone basis in what comes to defining relevant markets. This is especially true when the number of candidate products is large, and multiple elasticities have to be estimated and compared. Cross-price elasticity merely examines whether substitution exists between two paired products, but cannot address the market definition question as a whole, i.e. to what extent this substitution could restrain the actions of rival market players. Hence, concluding that peaches do substitute bananas when available, for example, still requires an assessment of the degree of this substitution (would banana producers be able to raise prices by 5-10% in the summer months without losing significant sales?), and necessitates an additional corresponding analysis pairing bananas with any other fresh fruit. However, as this case was decided years before such insights penetrated anti-trust law, it would suffice to note here that even the limited use of this concept here was misplaced.

A further distinct element in the decision concerns the apparent connection made by the court between bananas and the group of people it mostly serves, i.e. those who are the 'toothless', and do not perceive other fresh fruit to be

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24 A reference to temporal markets can be found at Office of Fair Trading, Market Definition, Understanding Competition Law (2004), at Part 5. Available at: <http://www.of.t.gov.uk/NR/rdonlyres/972AF80C-2D74-4A63-84B3-27552727B89A/0/OFT403.pdf>.

valid choices. As a preliminary remark, one may wonder whether this particular group would indeed prefer bananas to other soft fruit such as strawberries. This line of thinking did not come up at all in the ECJs argumentation.

More critically, even if one accepts that a certain part of the population does have a unique preference to bananas, this does not justify the court's extremely narrow market definition from an economic perspective. The existence of distinct consumer groups allows producers to employ price discrimination under certain conditions: a practice by which different buyers are charged different prices for the same product.<sup>25</sup> In the banana example, this would mean that bananas would be sold at a higher price to the 'toothless' population and at a lower price to the rest, since the latter group would have less willingness to pay for bananas upon the availability of other fruits. Implementation of such a pricing scheme requires, however, that banana producers would be able to distinguish between the different groups, and that members of one group would not be able to resell the product to members of the other group. If these requirements are met, the product market definition might be narrowed down to the use of the product by the group of interest.<sup>26</sup> Such an application undoubtedly does not apply to banana consumers. Banana producers have no way of differentiating between 'toothless' consumers and those who can chew, let alone preventing arbitrage between them. After all, the very young and the very old do not regularly shop for themselves. As a result, there is no economic rationale to categorise bananas as a single relevant market, despite the special needs of some part of the population. Even though 'toothless' people might single out bananas as distinguished from other fruits and regard them to a limited extent only as interchangeable, producers in fact have no means to identify them and therefore have no power to abuse their special position.

Indeed, in its 1997 Notice on market definition, the Commission eventually accommodated these considerations, by referring to the possibility of narrowing market definition upon the possibility of price discrimination:<sup>27</sup>

"The extent of the product market might be narrowed in the presence of distinct groups of customers. A distinct group of customers for the relevant product may constitute a narrower, distinct market when such a group could be subject to price discrimination. This will usually be the case when two conditions are met: (a) it is possible to identify clearly which group an individual customer belongs to at the

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25 On price discrimination see generally R.S. Pindyck and D.L. Rubinfeld, *Microeconomics*, Prentice Hall (6<sup>th</sup> ed., 2005), at 383-393.

26 See for example U.S. Horizontal Merger Guidelines, at §1.12.

27 1997 Notice, at para. 43.

moment of selling the relevant products to him, and (b) trade among customers or arbitrage by third parties should not be feasible”.

This paragraph is clearly inspired by economic thinking, as it follows the conditions for price discrimination outlined by the economic literature on this topic. It may therefore serve to exemplify the dangers associated with ‘intuitive’ market definitions, and indicates that the ECJ erred in its United Brands decision. As explicitly noted by one legal textbook in its discussion of the case:<sup>28</sup>

“Few economists would define a market so narrowly and if the hypothetical monopolist test described below is used, the Commission would not do so these days”.

### 5.3 Nestlé / Perrier<sup>29</sup>

#### 5.3.1 Facts and Judgement

Nestlé, a publicly held Swiss company active in many sectors of nutrition and selling food products throughout the world, attempted to acquire Perrier, a French manufacturer and distributor of bottled water. The proposed merger was thought to primarily affect the business of ‘source water’, relating to bottled water originating from a natural spring or source. The latter can be labelled ‘mineral water’ only if it fulfils certain legal requirements in relation to water quality and composition, and obtains authorisation from the competent authorities. Source water that does not qualify as mineral water is called ‘spring water’, and its production and marketing is also subject to a similar authorisation procedure.

Nestlé’s and Perrier’s source water bottling activities were concentrated in France (though Nestlé was also considerably active on the German market), with the well-known brands Vittel and Hepar for Nestlé, and Contrex, Volvic, Perrier, Saint-Yorre and Vichy for Perrier. However, whereas Nestlé mostly marketed still mineral water in France, Perrier was present both in the still and sparkling mineral water segments. A third significant supplier of source water, active in France, was BSN.

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28 Korah (2004), *op. cit.*, at 97.

29 Case IV/M.190 Nestlé/Perrier, (1992) OJ L 356/1.

The relevant product market definition in this case revolved mainly around two questions:

- (1) Did mineral water and soft drinks belong to the same relevant market?
- (2) Did still source water have to be distinguished from sparkling and flavoured waters?

With regards the first question, Nestlé argued that bottled source water did not form a distinct relevant market, and that the relevant market to assess the impact of the concentration was that of ‘non-alcoholic refreshment beverages’. This market fulfilled the basic function of quenching consumers’ thirst, and therefore encompassed both bottled source water and other soft drinks. The Commission, on the other hand, asserted that if such functionality served the basis for establishing the product market, additional drinks such as tea, milk, beer or certain fruits, must also belong to the same market. In particular, the Commission adhered to the view that bottled source water constituted a relevant market, whose players could act independently of the actions of soft drinks producers. In an elaborate decision, the Commission explained its reasoning for separating bottled source water from other soft drinks for the sake of market definition. This part of the decision accounted for both demand considerations and supply considerations, summarised below.

### **Demand Considerations<sup>30</sup>**

- (1) Consumers’ motivations. Consumer surveys indicated that French consumers purchased bottled source water due to its image as a natural product, associated with cleanliness, absence of contamination and a healthy lifestyle. Consumers were shown to relate to the positive action of water from a natural source on the human body, and highly valued the purity of the water, the absence of a bad taste compared with tap water and the presence of minerals, in that order. These very features were also the central focus of Nestlé, Perrier and BSN marketing campaigns.
- (2) Differences in composition, taste and intended use. Source waters were bought regularly by consumers for daily use to fulfil a basic alimentary need, whereas soft drinks were consumed more occasionally, often in a social context, and in moderation. In France in 1990, per-person consumption of bottled water was 104.8 litres, compared to 29.9 litres of carbonates, 9.6 litres of still drinks, and 8.6 litres of fruit juices. Moreover, soft drinks were normally manufactured with tap water and contained ad-

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30 Id., at para. 10-14.

ditional flavour and sugar. They therefore had a different taste from source water, and were drunk not only to quench thirst, but also to satisfy a particular taste pleasure.

- (3) Low responsiveness of source water to price changes:
  - (i) Substantial differences in absolute prices. According to manufacturers' price lists, source waters (both still and mineral) were priced in the range of 0.85-3.65 French Franks, and soft drinks (Coca-Cola, tonics and still orange flavours) between 6.1 and 9.4 French Franks. Retail prices (prices for the end consumer) reflected a similar gap.
  - (ii) Targeted marketing activity and consumer perception. The market for bottled source water in France was characterised by strong marketing and promotional activities, with high advertising budgets for the three main suppliers. As a result of this image, consumers did not consider soft drinks as a substitute for bottled source water for daily use at home. The attachment to source water (and to particular brands) reduced the importance of the price as a purchasing criterion. It therefore seemed unlikely that a small increase in the price of source water would induce a shift of consumers away from bottled source water to soft drinks.
  - (iii) Price evolution. Manufacturers' prices of source water and soft drinks indicated a very different evolution in the five years preceding the investigation. Whereas water suppliers were able to substantially increase both nominal and real prices, soft drinks prices decreased during that period. Additionally, manufacturers in both sectors did not seem to take into account in their pricing policies possible substitution by consumers of source water to soft drinks. This price evolution suggested that even strong and sustained reductions of soft drink prices would not force the demand for source water down, nor would it affect the ability to increase their prices.

The cumulative effect of these three factors led the Commission to believe that an appreciable non-transitory increase in the price of source water compared with that of soft drinks was unlikely to make consumers switch from source water to soft drinks by reason of their price only.

- (4) Views of retailers. Retailers consulted by the Commission regarded source water and soft drinks as distinct products. Reasons such as high household consumption, high brand awareness and health concerns, lead retailers to treat the supply of source water to consumers as obligatory, irrespectively to the provision of soft drinks. Retailers have thus testified that they did not perceive both types of drinks as substitutes, as both needed to be present in stores.

**Supply considerations<sup>31</sup>**

- (1) Conditions of production and marketing of source water and soft drinks in France were subject to different constraints, for several reasons:
  - (i) Differences in regulatory requirements. Spring and mineral waters were subject to authorisation, which could be lengthy. Moreover, bottling plants had to be located at the source, and mineral water could only be marketed under the trade mark referring to their respective source. Such constraints did not exist for soft drink manufacturers, who could franchise the bottling or distribution processes to independent bottlers.
  - (ii) Different market players. Soft drink producers in France have generally been unable to enter the provision of source water, and vice versa, mineral water suppliers were not significantly engaged in the soft drink market.
- (2) Manufacturers' pricing tended to differ for each market. Whereas since 1987 soft drinks had exhibited a declining price trend, the real price of mineral waters had evolved in the face of an expanding demand. This result was supported by a price correlation analysis, which presented a very high correlation coefficient among the different brands of waters, and a very weak and even negative correlation between soft drinks and bottled water. Most interestingly, an orange drink produced by the parties' rival BSN, appeared to be insignificantly correlated with BSNs water brands, though produced by the same company.
- (3) The combination of manufacturing constraints illustrated above rendered supply-side substitution unfeasible. Soft drink producers (even those with excess capacity) could not easily surpass the legal requirements for the supply of source water.

It was thus concluded by the Commission that soft drinks did not belong to the same relevant product market as source water.

Once the candidate market was confined to source water, the Commission further approached the distinction between still and sparkling or flavoured water. The latter product exhibited different demand factors – characteristics, intended use, volumes consumed and price levels – when compared to still water. In some exceptional cases, packaging, marketing and pricing of sparkling and flavoured waters resembled those of soft drinks. It was, however, not possible to dismiss the potential for competition between all types of water due to supply consider-

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31 Id., at para. 15-18.

ations. Technically, water producers could readily supply sparkling or flavoured water, as in effect, the parties were already doing. As a result, the Commission chose to classify sparkling and flavoured water as a separate segment within the market of bottled source water, but refrained from generating a definitive conclusion as to the market definition issue. Instead, it contended that excluding sparkling and flavoured water would not serve the appraisal of the merger at hand.<sup>32</sup>

The product market definition depicted above was accompanied by a geographic market definition, constructed with a similar vigour.<sup>33</sup> Two competing definitions were considered in this part of the decision: a national market comprising only of France advocated by the Commission, and an extended market including France, Belgium and part of Germany, a definition advanced by Nestlé. Nestlé claimed that the relevant market should be extended on the basis of its level of exports to other areas. Since price discrimination was impossible, locations where Nestlé sold abroad arguably constrained Nestlé's pricing in France. If excessive prices were inflicted on the French market, parallel imports into France would develop. The mere threat of such imports would serve to restrain Nestlé's pricing strategy in France.

The Commission examined this contention. It was, however, inclined to amend its conclusion, that parallel imports were practically impossible, and that Community competitors would not be able to penetrate the French market, based on several factors investigated:

- (1) The competitive environment among Member States:
  - (i) Demand characteristics differed greatly, with some countries exhibiting very low demand for bottled source water, and other countries showing preference to sparkling water and consumption levels close to those of carbonated soft drinks.
  - (ii) Trade flows within the Community, or the transport of water over distance, appeared to be negligible. With water being a low-value/high-volume product, and with the prevalence of glass bottles in some of the countries, the resulting high cost of transportation implied that source waters were generally consumed in the land of production.
  - (iii) French exports into countries bordering France were generally minor, except for Belgium, where exports amounted to 10%, possibly due to the small size and the formative stage of the Belgian market.

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32 Id., at para. 20.

33 It is interesting to note that while the entire decision is spread across 35 pages, the market definition exercise (product and geographic dimensions altogether) occupies almost 12, hence over one third of the decision.

- (iv) Supply in Germany, Italy and Spain was highly fragmented, with no supplier enjoying a significant market share. Only in Belgium did the two main producers enjoy market shares of 27% and 10%, but with the market being small, no significant export activity to France ever existed.
- (2) French exports and the threat of parallel imports into France could not constrain the conditions of competition in France. Water was considered an expensive product (with respect to its value) to transfer in large volumes, rendering parallel imports unlikely and unprofitable. Moreover, prices of Nestlé water to consumers in Belgium and Germany were significantly higher than in France. In addition to paying elevated prices, a parallel importer would have been faced with transport back to France, together with the need to un-pack re-label and repack each bottle, making any potential parallel import implausible.
- (3) Imports to France were negligible, and barriers to entry into the French market indicated that French suppliers could impose a sustainable price increase irrespectively of any external competitive constraint, either from remote areas or from sources located near France. Distribution of source water in France (large volumes transported by train in complete wagons) implied that any external competitor would suffer a significant transport cost disadvantage, having to develop the necessary logistics and sufficient volume. Moreover, as past experience showed, most attempts to enter the already-mature French market failed. This was attributed to consumer recognition of the well-established national brands (associating entry into the market with high risk), the need to overcome heavy advertising by the three market leaders, and the high degree of concentration held by the latter.

### 5.3.2 Assessment of the Commission Decision

In a nutshell, the Nestlé/Perrier case is a story of oligopolistic dominance. Three national water providers, Nestlé, Perrier and BSN, controlled over 82% of the source water market (in terms of value), accompanied only by a small fringe of local water providers.<sup>34</sup> With a market so highly concentrated, concerns about post-merger weakening of competition appeared justified. Even though Nestlé volunteered upon completion of the merger to transfer Volvic, one of the major still mineral water brands of Perrier, to BSN, the merger would have still resulted in a duopoly in the relevant market, namely in a reduction in the number of significant players from three to two.

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<sup>34</sup> Importantly, the Commission in this case expanded the scope of EU merger control, by acting not only against single-firm dominance, but also against oligopolistic dominance. Case IV/M.190 Nestlé/Perrier, (1992) OJ L 356/1, at para. 108-116.



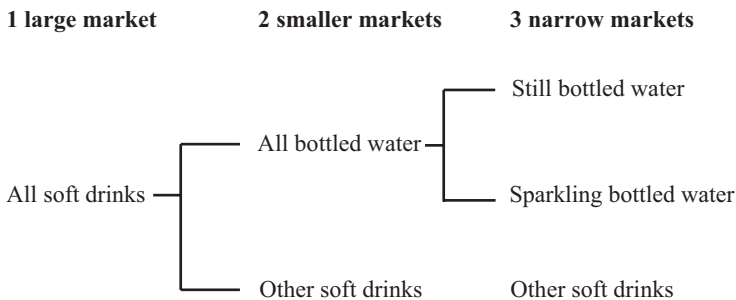
The protracted Commission analysis of the merger in general, and the definition of the relevant market in particular, serves as an interesting case-study encompassing a wide range of qualitative and quantitative considerations. Most remarkably, although the case preceded the promulgation of the 1997 Notice by several years, it established that the market definition exercise should comply with the reasoning presented by the SSNIP<sup>35</sup>:

“The Commission considers that a limited substitutability in terms of functionality alone is not sufficient to establish substitutability in competition terms. In the present case, if the only criteria to establish substitutability was to be quenching thirst, many products of very different nature which fulfil that function would have to be considered as belonging to the same market (tea, milk, beer, certain fruits, etc.). Several factors, however, indicate the existence of a distinct market for bottled source waters, where operators are able to act with a significant independence of the actions of companies selling soft drinks, in particular in the area of pricing”.

Therefore, the Commission focused on the key question pertinent to the market definition exercise, that is, whether **“an appreciable, non-transitory increase in the price of source waters, would lead to a significant shift of demand from source waters to soft drinks”**,<sup>36</sup> and whether **“French suppliers are able to impose appreciable non-transitory price increases without suffering any external competitive constraint”**.<sup>37</sup>

Following that line of reasoning, the Commission applied the SSNIP methodology to consider three potential market definitions:<sup>38</sup>

**Figure 1.** Alternative Market Definitions in Nestlé/Perrier



35 Id., at para. 9.

36 Id., at para. 13.

37 Id., at para. 29.

38 S. Bishop and M. Walker, *Economics of E.C. Competition Law: Concepts, Application and Measurement*, Sweet and Maxwell (2nd ed., 2002), at 386.

The Commission advanced the second option. A careful examination of both demand and supply factors collectively revealed that French water producers did indeed enjoy a privileged market position – making them a relevant antitrust market.

As described above, qualitative analysis was abundant in this investigation. The Commission was seemingly convinced by the unique image of source water, and applied traditional legal tests such as product characteristics and intended use to distinguish them from other soft drinks. This perception was stimulated further by both consumer surveys and interviews with retailers, and appeared to dominate the Commission's view on the boundaries of this product market. Other indicators on the supply side, such as the limitations of production (regulation, capacities) and the existence of barriers to entry, pointed in the same direction.

The Commission did not, however, settle for qualitative indicators, and supported its analysis with quantitative measurement techniques, most notable among which were the Commission's analysis of prices and the assessment of shipment patterns.

The analysis of price trends comprised of three price criteria to deduce low responsiveness of consumers to price changes. First, price evidence indicated a significant gap between bottled water and soft drinks' absolute prices, with soft drinks priced considerably higher. Absolute price comparisons had already been used by the Commission in prior decisions.<sup>39</sup> As asserted in the fourth chapter of this book, absolute price comparisons carry the risk of generating biased market definitions, as they may simply reflect different quality or preferences, while remaining uninformative with regards the real question posed by the SSNIP, that is to what degree the pricing of bottled water is constrained by soft drinks.

Second, the Commission inspected price evolution of these products, and showed that past reductions in real soft drinks prices were not accompanied by similar reductions of source water prices. This could indicate that suppliers' pricing policies in these markets were not interrelated.

Third, the Commission utilised the results of a price correlation analysis, part of which is demonstrated in the table below:<sup>40</sup>

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39 E.g. Case IV/M.0057 Digital/Kienzle, (1991) OJ C 56; Case IV/M.053 Aerospatiale-Alenia/de Havilland, (1991) OJ L 334/42; Case IV/M. 315 Mannesmann/Vallourec/Ilva, (1994) OJ L 102/15.

40 The table forms an extract from the Commission's Statement of Objections. See Lexecon Ltd., *Quantitative Techniques in Market Definition* (1999), at 11.

**Table 1.** Results of Price Correlation Analysis

		Still waters			Sparkling waters			Soft drinks		
		A	B	C	D	E	F	G	H	I
Still Waters	A	1.00								
	B	0.93	1.00							
	C	0.91	0.94	1.00						
Sparkling waters	D	0.91	0.85	0.86	1.00					
	E	0.94	0.97	0.95	0.92	1.00				
	F	0.93	0.99	0.96	0.88	0.99	1.00			
Soft drinks	G	0.11	0.05	-0.01	-0.33	-0.02	0.01	1.00		
	H	-0.57	-0.55	0.25	0.16	0.24	0.27	0.17	1.00	
	I	-0.77	-0.75	-0.81	-0.86	-0.86	-0.79	0.33	-0.11	1.00

The table depicts correlation coefficients for all possible pairs of drinks. For example, the coefficient between brand C and brand E is positive and equal to 0.95, while the correlation between brands B and G is 0.05. The shaded cells highlight pairs that are significantly correlated, representing a high degree of correlation between the various brands of still water and between brands of sparkling water. Moreover, a high degree of correlation is observed also between sparkling water and still water suggesting that the latter products are able to effectively constrain one another. Another clear pattern deduced from the table is that much weaker correlations are reflected between water and other soft drinks, arguably placing them in separate relevant markets.

Despite the seemingly conclusive findings of this analysis, it is crucial to remember that while high correlations imply some degree of substitution between the two products, the main issue remains whether this substitution is sufficiently strong for both products to be included in one relevant market. In this case, the weight of this evidence in conjunction with the other price trends outlined above provided support for the Commission's reasoning; one could not reasonably expect an appreciable non-transitory price increase to induce substitution from source water to soft drinks, especially since Nestlé neither argued against these findings, nor against other factors in the economic analysis, for example the frequency of observations, the type of price reported and the period covered by the sample.

It should be acknowledged, however, that price correlation analysis still suffers from several shortcomings, elaborated in detail in Chapter 4. For example, such an analysis excludes an account of supply-side substitution. Could Coca-Cola

enter the market in response to an increase in the price of water, thereby inducing consumers' substitution? This question cannot be answered by correlation analysis alone. One must therefore remain cautious in making decisive conclusions based on (supposedly convincing) price correlation results, without subjecting them to further substantiation.

Note that verifying the results in this particular case may be achieved by employing the benchmarking technique discussed earlier in this book. This technique selects, for example, the average correlation between still water brands as the benchmark (as it would be relatively straightforward to include different brands of still water in one product market), against which the correlation between still and sparkling water would be assessed. To take a hypothetical example, how would one interpret an average correlation of 0.75 between still and sparkling water brands? If the threshold correlation (still water-still water) is substantially higher, say 0.9, this would suggest that prices of still water are weakly correlated to the price of sparkling water, and the latter would be assumed exogenous to that market. If, on the other hand, the average correlation would be approximately the same, this would strengthen the argument for one relevant market. In the table stylised above, correlations were sufficiently high to provide results which were fairly uncontentious.<sup>41</sup>

A second quantitative measure employed by the Commission to address market definition was the analysis of transport and shipment patterns. Nestlé representatives in this case had performed an Elzinga-Hogarty shipment test in order to assess whether the relevant geographic market was exclusively France.<sup>42</sup> The test has shown that the LIFO threshold, indicating a low level of imports into France was firmly satisfied. At least 90% of all bottled water sold in France was produced by local suppliers. However, the LOFI condition was not met, showing that exports from France exceeded 10% of the total consumption. Such results were inconclusive, and opened the door to different interpretations.

Most naturally, Nestlé has argued that the level of exports from France to other areas should be taken into account in the definition as indicative of a larger geographic market. According to Nestlé, price discrimination between France and the areas where it sold abroad was not possible, at least in relation to Belgium and certain parts of Germany. Therefore, its pricing in France would be restrained by the conditions prevailing in neighbouring markets where Nestlé was present, although conditions of competition in these other markets substantially differed. Moreover, it argued that if excessive prices were to be applied in

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41 Id., at 13.

42 Id., at 23. Lexecon has performed economic analysis for Nestlé in this case.

the French market, parallel imports into France would develop. Hence according to Nestlé, the mere threat of parallel imports would jeopardise any dominant position in the French market.

This approach was, however, rejected by the Commission. It did not disagree with the data reflecting that French producers exported 10% of their water (in terms of volume) to Belgium, nor that 5% of the water consumed in Germany was imported from France (the remaining neighbouring countries – Italy and Spain – had a negligible import rate), but asserted that in view of the different competitive environment prevailing in each Member State, and especially the practical impossibility to develop parallel imports, the relevant geographic market remained France, and should not be extended. As the Commission argued, the high level of French exports into Belgium could be explained by the small size and relative immaturity of that market, whilst the low level of imports into France could be attributed to asymmetries between the regions, namely the difficulty to overcome substantial barriers to entry into the French market. These conditions suggested, in line with the SSNIP methodology, that French water producers could act independently towards their local consumers, and that French water sold elsewhere did not pose a genuine competitive constraint to pricing inside France.

This conclusion was further reinforced by the results of transport costs tests. Nestlé itself had estimated the impact of transport costs at 10% for 300 km for the most expensive still waters, and over twice as much for glass bottles. Resulting from the low value yet high volume of this product, water could not in general bear transport costs over long distances, a factor which implied localisation of the market.

As a final note, it seems that this case, if heard today, could have made a suitable candidate for a merger simulation analysis. To recall, the aim of simulation models is to predict the likelihood of a post-merger unilateral price increase by the merging parties. Hence their primary concern is not the possible creation of a dominant position after the merger – the crucial focus from a structuralist point of view – but the potential harm a merger might inflict on competition in the market. A simulation exercise may utilise pre-merger market factors (i.e. prevailing prices, marginal cost, estimated elasticities of demand) in an economic model that anticipates the interaction between the firms. Assuming profit-maximisation by the merging parties, the model is therefore able to calculate the post-merger price and profits, allowing a direct assessment of the merger effect on competition.

However, the application of these models is often compromised by their data requirements and the need for a considerable economic expertise. In effect,

merger simulations are not regularly employed by the Commission,<sup>43</sup> and unilateral effects are often assessed merely on the basis of structural indicia. As was also the case here, particularly high market shares of the remaining market participants after the merger, their immense free capacities, inadequate counterweight of local competitors, reduction in retailers buying power, substantial barriers to entry, improbability of potential competition, and the absence of prospective post-merger cost savings, all led the Commission to believe that the merger would significantly impede competition and cause considerable consumer harm. Yet, as the Commission was generally inclined to consider economic evidence, and since the case was apparently data-intensive – including the relevant figures on pre-merger prices, costs and margins – simulation might have been able to complement and increase the confidence in the results of the Commission’s competitive effects analysis.

## **5.4 Procter & Gamble / VP Schickedanz (II)<sup>44</sup>**

### **5.4.1 Facts and Judgement**

Procter and Gamble (P&G) and Vereinigte Paperwerke Schickedanz (VPS) were companies active in the production of household paper products and feminine hygiene products. Competitive constraints associated with their prospective merger were raised mostly with respect to feminine hygiene products, comprising pant liners, sanitary towels (pads) and tampons. While VPS manufactured all these products, P&G produced panty liners and towels but not tampons. Those three products, according to P&G, constituted a single market, in particular tampons and towels, which arguably compete vigorously since they share the same usage, and enable women to switch readily between them. The Commission was, however, of the view that panty liners, tampons and sanitary towels each constituted a separate product market.

Quite intuitively, panty liners differ from tampons and towels as they are generally used outside the menstrual period, or immediately before and after. Their limited absorbent capacity (about one quarter than that of a towel) renders them unsuitable for primary menstrual use, and their main purpose – also reflected in their marketing campaigns – is to provide ‘feminine freshness’ rather than protection. Moreover, different suppliers stated before the Commission that supply-side substitution would necessitate retooling, required to alter the

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43 Notably, the Commission made use of merger simulation approaches in Case Comp/M.1672 Volvo/Scania, (2001) OJ L 143/74 and Case COMP/M.3216 Oracle/PeopleSoft, (2005) OJ L 218/6, albeit not yet decisively. See the foregoing discussion in Chapter 4.

44 Case IV/M.430 Procter & Gamble/VP Schickedanz (II), (1994) OJ L 354/32.

dedicated machines. Such retooling was perceived as being uneconomical, especially given the non-technological barriers to entry into the towel market (among others brand loyalty, access to distribution, and advertising sunk costs). For the above reasons, panty liners were excluded as a feasible substitute for tampons or towels. The central focus of the investigation thus remained the distinction between the two latter products.

The decision enlists a wide range of qualitative considerations aimed at establishing separate markets for tampons and towels, most notably among which:

- (1) Product characteristics and featured variations (shape, style, packaging, performance), including the different materials of which towels and tampons are produced, and the different mode of usage of these products.<sup>45</sup>
- (2) Consumption preferences and patterns of usage, indicating for example that women tend to use tampons while swimming, whereas they typically revert to towels after childbirth.<sup>46</sup>
- (3) A central role for non-price considerations in selecting the method of menstrual protection, such as comfort, security and discretion.<sup>47</sup>
- (4) Non-performance considerations such as potential aversion of some women to tampons – an internal device – due to young age, moral or ‘naturalistic’ perceptions.<sup>48</sup>
- (5) Views of P&G’s main competitors in Europe, such as Johnson & Johnson, Kimberly-Clark and Moelnlycke, unanimously advocating the separation of tampons from towels.<sup>49</sup>
- (6) Likelihood of supply-side substitutability, which appeared to be remote in light of the unrelated technologies used to produce tampons and towels.<sup>50</sup>

Supported by different surveys submitted to the Commission, all the above differences between towels and tampons indicated, in the Commission’s view, that most women had a habitual preference for one or the other protection method for different situations in life, whether that be sports, socialising, in the office or at home. Placing strong emphasis on the role of consumer preferences and their subjectivity, the Commission argued that “while it is true that both tampons and towels broadly perform the same function, they do so in such a different way that they are not regarded as substitutes by the consumer once she has estab-

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45 *Id.*, at para. 32-34.

46 *Id.*, at para. 38.

47 *Id.*, at para. 41.

48 *Id.*, at para. 41.

49 *Id.*, at para. 46.

50 *Id.*, at para. 30.

lished a preference or a pattern of usage”.<sup>51</sup> In addition, the Commission drew from two pieces of empirical evidence – a study on price elasticities and a shock analysis – to ascertain its market definition. Both techniques are discussed in detail below.

With respect to the geographic reference market, the definition was confined to Germany and Spain, against the submission of P&G for one Western European market or alternatively three regional markets (Nordic countries, North European and South European countries). The Commission asserted, however, that the markets in Germany and Spain were national, due to specific demand and supply condition, which would allow the parties post-merger to retain their market power without suffering any major competitive constraints external to the region. However, this part of the decision is not further addressed, as it rests primarily on qualitative considerations.

#### **5.4.2 Assessment of the Commission Decision**

From an economic point of view, the most interesting issues emerged in the discussion of product market boundaries. Among the large variety of arguments affecting the choice between towels and tampons, the critical question of market definition eventually emerged:<sup>52</sup>

“whether they [women] would ‘be prepared to switch to tampons/sanitary pads occasionally?’ if a better pad/tampon were available or if the price of one method were increased by 10%”.

Several surveys submitted to the Commission attempted to provide an answer to this question – synonymous to the one raised by the SSNIP test – presenting data on the willingness of women to readily switch between towels and tampons. A survey commissioned by P&G showed that 31-50% of women would consider purchasing a different mode of protection on the basis of a 10% price increase in the other form. The Commission noted, however, that no robust conclusions regarding substitution patterns may be based on such a result, since the willingness of women to *perhaps* try a product or use it sporadically may not constitute any real change in their regular habits.<sup>53</sup>

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51 Id., at para. 42.

52 Id., at para. 48. Whilst the Commission did not particularly analyse market definition against this benchmark, it did dedicate a considerable discussion to the issue whether buying habits would be altered following a 10% price increase. Id., at para. 48-53.

53 Id., at para. 49.



A different consumer study commissioned by a Member State competition authority as part of an informal national investigation reflected different results as to the question whether a woman would *actually* change her method of protection in the event of its price increase. According to this survey, if prices of tampons of all brands escalated by 10%, 95% of sole tampon users and 80% of dual (tampons and towels) users would not change their level of consumption, while 3% and 12% respectively would diminish their purchases. Asking a similar question with respect to the price of towels being raised now, the survey reflected that 89% of sole towel users and 78% of dual users would not change their habits, while 11% and 8% respectively would use fewer. The Commission seemed to side with the results of this study, which implied a continued loyalty to a particular form of protection, over the one submitted by the parties, as it “draws the woman’s attention to a hypothetical price increase and emphasizes the possibility of switching”.<sup>54</sup> Especially significant in the Commission’s view was the finding that the vast majority of dual users would adhere to their habits despite familiarity and approval of both methods.

These findings were also supported by a Nielsen’s household purchase panel data, which showed that out of exclusive towel or tampon users in a certain period, 87% and 82% respectively remained exclusive users in the following period.<sup>55</sup> Such a rigid purchase patterns of towels and tampons among woman advanced therefore the conclusion of separate relevant markets for each product.

Additional powerful insights were enabled in this case due to price and cross-price elasticity estimations. Using scanner data from several sources, the parties purported to show that the sales of towels were influenced by the price level of tampons, and that they were therefore in the same relevant market.<sup>56</sup> The data indicated high own-price elasticity for the towels’ leading brand Always, combined with a significant cross price elasticity in the case where the price of Always decreased. When the price of Always increased, however, the own-price and cross-price elasticities were much lower.

As a first concern, although the actual elasticity figures were kept confidential, there appear to be several methodological problems involved in this type of analysis. To begin with, P&G has brought the data to support their claim that the sales of towels were connected to the price of tampons.<sup>57</sup> In economic

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54 Id., at para. 50.

55 Id., at para. 51.

56 Id., at para. 54.

57 Id.: “P& G claims that sales of towels **are influenced by the price level of tampons** and that they are therefore in the same product market. GfK scanner data provided by P& G purports to show ... the existence of cross price elasticity between towels and tampons” (emphasis added).

terms, such a relationship could be deduced from the cross price elasticity of towels with respect to tampons. To recall, a cross-price elasticity of product X with respect to product Y measures the extent to which the volume of sales of X responds to changes in the price of Y. Under the circumstances of the case, this would require observing the change in the sales of towels after any change in the price of tampons. The parties' reasoning, however, was opposite:<sup>58</sup>

“The scanner data from GfK of weekly sales for 52 weeks from a sample of 120 stores with a surface of more than 800 m<sup>2</sup> thus shows that a [ ] reduction in the price of Always produced on average ... a decrease in sales of ob tampons of [ ] ... while a [ ] increase in Always' price resulted in an [ ] increase in sales of ob”.

Whilst the economic term – cross price elasticity of towels with respect to tampons – was correctly invoked, its economic application was misguided. By inspecting the change in the sale of tampons following a price increase or decrease of towels, the parties' analysis deduced, in effect, the cross price elasticity of tampons with respect to towel rather than the other way around.

Notwithstanding this terminological confusion, the elasticity results still need to make sense economically. The existence of meaningful cross-price elasticity between towels and tampons may indicate that consumers viewed the products as substitutes and were ready to switch upon inflicted changes in price. The Commission mentioned, however, that such a tendency was mostly observed when the price of towels fell, rather than when towels increased in price. Namely, the estimated own-price and cross-price elasticities were much lower in the case of a price increase.<sup>59</sup> Such a purchasing pattern may raise questions about the structure of the demand curve for towels, as it should be explained why substitution from tampons to towels took place mostly when Always' prices fell, and why consumers adhered to Always in spite of its price rise.<sup>60</sup>

Another fundamental weakness of this type of analysis is that the elasticity calculations submitted by P&G were based only on weeks when the price of Always was reduced. As such, the analysis comprised a rather limited number of observations, and more importantly, it failed to eliminate many irrelevant variations in the sales of Always following a change in its price (e.g. seasonal variations or promotions in other stores beside the scope of the scanner sample), from variations directly connected to competition between towels and tampons.

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58 Id.

59 Id.

60 In effect, this data strengthens the argument in favour of a separate towels market, as the demand for Always appears to be – contrary to the parties' submission – rigid.

As a result, any general conclusions concerning the effect of price changes on the sales of towels were deemed biased.

In order to distinguish the various effects of different explanatory variables from one another (price variations being just one among other possibilities that may explain changes in sales), and to exclude promotional elasticities, the Commission advocated carrying elasticity estimates within a model that would encompass as many relevant variables as possible, to address the complexity of that market. Such a model for estimating the effects of price changes while purging the effects of seasonal and other variations was developed by Nielsen, and was supplied to the Commission by Johnson & Johnson. This study was utilised to assess whether Always Super Thin towels – a towel type which was thought to compete most closely with tampons – indeed exhibited sales patterns supporting an intense competition between the two types of products. The analysis showed, however, that neither o.b. promotions nor its long-term price development had had any significant impact on the sales of Always.<sup>61</sup> Notably, the Nielsen analysis unlike its P&G counterpart also formulated the correct question in economic terms (or the cross-price elasticity of towels with respect to the price of tampons), namely, it asked what would happen to the sales of towels upon changes in the price of tampons.

The results of the Nielsen model were further confirmed by a separate analysis made by the American RLS company which was submitted to the Commission by a competitor. Whilst this study was based on U.S. (rather than EU) scanner data, the Commission effectively assumed that consumers' switching behaviour and key market characteristics were, under the circumstances, similar for the U.S. and the German (relevant geographic) markets. Hence, it drew on its results for the relevant elasticities.

The study established that the own-price elasticity of sanitary towels was -0.5, and that the cross price elasticity was 0.3. Such low elasticities conveyed that price was relatively insignificant for purchasers of the product in question, supporting the Commission's view that substitution was trivial and not motivated by price fluctuations, and further implying that sanitary towels and tampons constituted separate relevant product markets.<sup>62</sup>

A final observation of a quantitative nature was possible in this case as a result of a historical shock in the market in question. The subject shock was the launch of

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61 Case IV/M.430 Procter & Gamble/VP Schickedanz (II), (1994) OJ L 354/32, at para. 57.

62 Id., at para. 60.

Always towels into the German market in July/August 1991, which afforded an opportunity to observe ex-post the underlying competitive pressures. If tampons and towels were in the same relevant market, similar reactions from producers of both types of products would be expected following the above introduction of Always.

In order to establish the effect of the shock, the Commission examined what happened to prices in the towels and tampons markets, after six months and after two and a half years from the entry of Always. The results of this investigation are illustrated in the table below:<sup>63</sup>

**Table 2.** Response of Average Tampon and Towel Prices to the Launch of Always

Price change (%)	Tampons	Towels other than Always
Within 6 months	0.7	-3.8
At February 1994	18.2	2.3

As the data reflects, towels other than the Always brand responded to the launching event by short-term price reductions, and only a slight long-term increase. Tampons, on the other hand, enjoyed a small price increase already in the first six months, which was followed by a much more significant increase over the ensuing two years. Since only towel producers responded with a price cut, these figures suggest that Always only competed with towels. Tampon producers evidently did not feel threatened by the newly introduced towels, as they continued to raise their prices.

Examination of the products' market shares in Germany following Always' launch provided similar conclusions. The table below shows the relative volume share of towels and tampons of the combined towel and tampon market in Germany, and their evolution:<sup>64</sup>

**Table 3.** Towels and Tampons Market Share

	Always	Other towels	Total towels	Tampons
July 90/June 91	0	64	64	36
July 91/June 92	5	58	63	37
July 92/June 93	11	52	63	37

<sup>63</sup> Based on para. 63, Id.

<sup>64</sup> Based on para. 64, Id.

The introduction of Always into the German market did not induce a considerable change in the proportions of women using tampons. Always indeed captured market share from other towels, especially from VPS's Camelia brand, but not from tampons. The above results were further reinforced in an analysis of other EEA states, which repeatedly demonstrated that tampon volumes remained unaffected by entry of Always into the market.

Taken together, the above quantitative evidence, while not in itself conclusive, was strongly indicative of the existence of separate markets for pads and tampons. Having the correct question in mind, whether a small but significant increase in price would stimulate substitution between the different protection methods, the Commission was able to establish a convincing case for separating the products markets. Most importantly, refuting P&G quantitative data, composing a variety of household panels, scanner data and price studies, was achieved by equally quantitative means. The Commission's open acknowledgement of employing experts in market research analysis to draw economically sustainable conclusions from the materials at hand<sup>65</sup> signals its growing appreciation for quantitative tools to aid the competitive assessment, and the recognition that quantitative economic analysis has become indispensable to all practitioners of competition law.

## **5.5 Kimberly-Clark / Scott<sup>66</sup>**

### **5.5.1 Facts and Judgement**

The proposed merger of Kimberly-Clark (KC) and Scott Paper presents an interesting combination of quantitative techniques aiding the market definition exercise in particular, and the competitive assessment in general. The case concerned two large-scale American paper manufacturers with substantial operations in Europe. KC was a worldwide leading supplier of a wide range of paper and related products for personal, business and industrial use, most notably disposable baby nappies, adult incontinence, feminine protection and sanitary tissue products. Scott was primarily active in the manufacture and sale of tissue products for personal care, environmental cleaning and wiping, health care and food service on a global basis. Hence, the merger was thought to strengthen KC and Scott's market position by combining strong consumer brands and bringing together their considerable production and marketing resources, forming the

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<sup>65</sup> Id., at para. 75.

<sup>66</sup> Case IV/M.623 Kimberly-Clark/Scott, (1996) OJ L 183/1.

world's largest manufacturer of tissue products, and the number 1 producer of tissue products in Europe.

As a starting point, the Commission distinguished consumer tissue products from away-from-home (AFH) tissue products;<sup>67</sup> the latter term relating to paper products that are mainly sold to industrial and institutional purchasers in large quantities for use in factories, offices, workshops and hospitals. The Commission did not, however, identify, any significant competitive concerns arising in the AFH market. Although the parties would become the leading supplier of AFH products subsequent to the merger, they would be faced with strong competitors and other constraining factors sufficient to discipline their conduct.<sup>68</sup> Consequently, the Commission focused the investigation on consumer tissue products, which were then divided into three separate markets:<sup>69</sup> consumer toilet paper products, kitchen paper and handkerchiefs/facial tissues,<sup>70</sup> both branded and unbranded. This definition was neither contested by the parties, nor by any other competitors and retailers.

Regarding the relevant geographic market, it was the UK and Ireland that formed the main areas of concern in the view of the Commission, in contrast to the parties' proposition of a Western European relevant geographic market.<sup>71</sup> This conclusion was based upon several cumulative indicators:

- (1) Trade flow for finished tissue paper products<sup>72</sup> was low, and tended to fall sharply as distance increased. Strongest flow was identified mostly between neighbouring countries, e.g. UK/Ireland, Spain/Portugal, Italy/Germany<sup>73</sup>. In addition, the transport costs of tissue products were high in relation to its value, implying that the transportation of finished tissue products was not commercially viable.<sup>74</sup>
- (2) There appeared to be an important difference in prices between UK and Continental Europe.<sup>75</sup>

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67 Id., at para. 33, 55.

68 Id., at para. 57.

69 Id., at para. 53.

70 Handkerchiefs and facial tissues are products that fulfil a similar function while only being packaged differently: handkerchiefs are packaged in boxes while facials are cellophane-wrapped in small, pocket-size quantities. Hence, the Commission viewed both tissue products as a single market.

71 Case IV/M.623 Kimberly-Clark/Scott, (1996) OJ L 183/1, at para. 71.

72 The term 'finished paper products' relates to end tissue products, in contrast to parent reels, which are the unprocessed form of paper, and which, be definition of the Commission, form a single relevant product market.

73 Case IV/M.623 Kimberly-Clark/Scott, (1996) OJ L 183/1, at para. 66.

74 Id., at para. 63.

75 Id., at para. 72-80.

- (3) Consumers' behavioural patterns differed between UK/Ireland and Continental Europe.<sup>76</sup>
- (4) The UK/Ireland markets were geographically separated, and involved substantial cost of transporting the finished good.<sup>77</sup>
- (5) Important brand differences existed between UK/Ireland and Continental Europe, with an exhibited preference to Andrex toilet paper (sold by Scott) and Kleenex Double Velvet (sold by KC), brands that were not significantly present in Continental Europe.<sup>78</sup>
- (6) Consumer products on the demand side differed. The UK retail trade was very concentrated and differed in that it placed greater emphasis on product quality. As such, it developed high quality private-label tissue products, unlike other European countries where private-label typically focused on lower levels of product quality.<sup>79</sup>
- (7) Substantial entry barriers, e.g. consumer brand loyalty and the need for advertising, further isolated the UK market.<sup>80</sup>
- (8) Despite some differences in production capabilities, identity of the leading retailers and brands sold, the situation in Ireland was similar to that in the UK, and the markets were becoming increasingly integrated.<sup>81</sup>

Within this geographic reference market, Scott Paper produced Andrex, the largest brand in the UK, while KC produced Kleenex, the second largest brand, both considered an essential part of the stock by all retailers.<sup>82</sup> The merger operation was hence expected to have a strong impact on the branded sector of the tissue market, which amounted to about half of the whole market. The parties' combined brand share was shown to reach 70-80% in the toilet tissue market, 50-60% in the kitchen rolls market, and 70-80% in the facial/handkerchief market, making them the evident market leaders across the full range of branded consumer tissue products.<sup>83</sup> The parties were also expected to become leading suppliers of private label products, enjoying a high total production shares in the range of 40-60%, and 50-60% in the important toilet tissue market.<sup>84</sup>

Such a dominant position, accompanied by a strong brand loyalty, advanced production technologies and significant advertising expenditure could not, in

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76 *Id.*, at para. 81-82.

77 *Id.*, at para. 83.

78 *Id.*, at para. 84.

79 *Id.*, at para. 85-86.

80 *Id.*, at para. 87.

81 *Id.*, at para. 88-96.

82 *Id.*, at para. 134.

83 *Id.*, at para. 124.

84 *Id.*, at para. 119.

the view of the Commission, be effectively challenged by existing and potential competitors, and threatened the conditions of competition in the markets of concern. Approving the merger was therefore preconditioned upon modifying the operation through a divestment of brands, businesses and production capacities.

### **5.5.2 Assessment of the Commission Decision**

Market definition in this case was debated mostly around the question of the geographic market, whereas the Commission's product market definition generally went undisputed. Even though, as noted by the parties, a certain substitution between tissue products of different uses existed (categorised by the Commission in different product markets), any such substitution was assumed marginal and insufficient to justify broadening market boundaries.<sup>85</sup>

However, a preliminary remark concerning the relevant product market is necessary. The issue of substitution between different types of tissue products, and in particular the importance of brands, was the focus of numerous quantitative studies, submitted by the parties and by a major competitor. Surprisingly, those studies were not utilised by the Commission in the evaluation of market boundaries, but rather in the competitive assessment stage of the investigation, with a market already predefined. The main focus of these studies, the question whether prices of branded products were constrained by prices of private-label products, is, however, clearly interesting from a market definition point of view.<sup>86</sup>

All studies attempted to analyse the UK toilet tissue market, two of them (studies by Cambridge Economics and Lexecon) by providing price and cross-price elasticity estimates for the overall market as well as for every individual market segment (i.e. branded versus private label). While the exact figures remained classified as confidential information and deleted from the public version, both studies, not surprisingly, estimated the overall market elasticity of demand to be low, namely the market demand to be inelastic.<sup>87</sup> This was a fairly expected result for an essential and inexpensive commodity such as toilet paper, and implied that the market was definitely not wider than 'toilet tissue products', since any 5% increase in the price of all toilet papers would result in less than 5% fall in its sales.

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85 *Id.*, at para. 45. Indeed, whilst the Commission acknowledged at para. 34, 54 the possibility of supply-side substitution among some of the paper products, these products were not interchangeable from a demand-side point of view.

86 To recall, the Commission has grouped together in each product market both branded and unbranded products.

87 Case IV/M.623 Kimberly-Clark/Scott, (1996) OJ L 183/1, at para. 174.



The studies differed, however, in their own-price and cross-price elasticity results. Whereas Cambridge Economics concluded that private-label toilet paper would constrain pricing in the branded segment, Lexecon argued that no such constraints were in force.<sup>88</sup> The Commission sided with Cambridge Economics' elasticity estimates, coupled with additional factors (among others, the high quality of private label toilet tissues available on the UK market, and the fact that the parties were largely involved in the production of private labels), which indicated that private label products did compete to some extent with branded products<sup>89</sup>. As concluded by the Commission:<sup>90</sup>

“considering all the facts it would rather seem that possession of the two leading brands in combination with the position as a leading supplier of super soft private labels would give Kimberley Clark/Scott Paper considerable leverage on the whole market of branded as well as private-label toilet tissue. In this case the inelastic price elasticities for total toilet tissue demand estimated by both Cambridge Economics and Lexecon ... certainly mean that there would be scope for the parties to abuse their position on the whole British market for toilet tissue following the merger”.

Demand elasticities in this case gave important insights into the product market definition, as comprised of toilet tissue, both branded and unbranded, and established that the parties' post-merger dominant position within this market was likely to lead to a lessening of competition.<sup>91</sup>

With respect to the relevant geographic market, of main interest in this investigation was the issue whether the market was wider than the UK and Ireland. To assess the competitive constraints within this region, the Commission utilised several quantitative tools, most notably an analysis of trade flow and transport costs, cross-European price comparisons, and the technique of shock analysis.

Data provided by the parties demonstrated limited imports at the Western European level (i.e. into Western Europe), representing about 3% to 4% of

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88 Id., at para. 175.

89 Id., at para. 176-177.

90 Id., at para. 177.

91 Compare, however, with the parallel U.S. investigation of that merger: Contrary to the Department of Justice's preliminary intuition that the merger was anti-competitive, based on a substantial increase in concentration in a market already highly concentrated, economic analysis of the potential price effects of the merger allowed the transaction to be cleared. See *USA v. Kimberly-Clark and Scott Paper*, Civil Action No. 3-95CV3055-P (D.C. Texas 1995), and discussion of the case in J.A. Hausman and G.K. Leonard, *Economic Analysis of Differentiated Products Mergers Using Real World Data*, 5 *George Mason Law Review* 321 (1997), at 335-336.

consumption, while exports amounted to approximately 2% of production. Such small percentages supported the conclusion that the geographic market was not larger than Western Europe. Moreover, the data also pointed to a significant trade flow of tissue products between Member States. Such findings allegedly removed the need to narrow down the market any further, as it showed that different European locations fairly constrained one another.

However, in addressing the issue of whether Western Europe in itself should be divided into separate geographic markets, the Commission made a distinction between parent reels (unprocessed paper) and finished tissue products (i.e. upstream and downstream products) positioned in its view in two distinct product markets.<sup>92</sup> The latter differed greatly in their costs of transportation. For parent reels, costs of transportation were very low, implying that they could be transported over great distances without suffering a significant additional expenditure. Hence the geographic market for parent reels was at least as wide as Europe. On the other hand, finished tissue products were bulky and of low value; features which made them expensive to transport. For example, transporting toilet paper from Northern Germany to the UK was estimated to exceed 15% of its sales value, and the cost of transporting kitchen towels would be greater than 25%. The following table demonstrates the average distance a finished tissue product could be viably transported over distance:<sup>93</sup>

**Table 4.** Average Maximum Distance for Viable Transportation

<b>Product</b>	<b>Average radius (km.)</b>
Toilet tissue	690
Kitchen towels	540
Facials	765
Hankies	865

As the table depicts, toilet tissue producers could operate in an area as far as 690 km from the original point of manufacturing, while kitchen towels could be transferred over a more limited range of approximately 540 km. Outside this scope, transporting tissue products became commercially unbeneficial.<sup>94</sup> Consequently, trade flows for finished tissue paper products were in fact very low, and fell sharply as distance increased.

92 Case IV/M.623 Kimberly-Clark/Scott, (1996) OJ L 183/1, at para. 27.

93 Id., at para. 63.

94 For the sake of comparison, parent reels produced in the UK were easily imported in very large quantities as far as South America. Id., at para. 64 Table 5.

In particular, trade flows of finished tissues were mostly detected among neighbouring countries, and especially between the UK and Ireland. For example, the following table provides data on European exports and imports of toilet tissues (in tons):<sup>95</sup>

**Table 5.** Transnational Flow – Exports/Imports of Toilet Tissue

	<b>UK exports to</b>	<b>Ireland Exports to</b>	<b>Italy exports to</b>	<b>NL exports to</b>	<b>Spain exports to</b>	<b>Total (imports)</b>
UK	-	581	1,522	1,980	0	15,751
Ireland	14,766	-	134	79	0	15,154
Italy	318	0	-	422	81	2,905
NL	1,417	0	4,316	-	15	38,367
Spain	177	0	9,972	453	-	15,577
Others	4,420 (France)	8	75,792 (Germany)	9,755 (Germany)	10,764 (Portugal)	-
Total	24,622	589	127,624	31,170	13,017	-

It can be seen that almost all Irish exports were aimed at the UK, while the UK exported to Ireland more than half of its total exports. Such patterns were indicative of a common UK/Ireland relevant market, as the ability to transfer products across regions constrained pricing policies in these countries.<sup>96</sup>

The Commission went further and considered the geographic separation of the UK/Ireland islands in terms of price. Data submitted by the parties indicated that the price of consumer toilet tissue paper in the UK was more than 40% higher than its price in Germany, Italy and Spain. For handkerchiefs, the UK market was shown to be priced more than 100% higher.<sup>97</sup> These figures matched retail price differences measured by Nielsen supermarket scanner data:<sup>98</sup>

<sup>95</sup> Id., at para. 66.

<sup>96</sup> Another observation taken from the table is that Italy had a very high level of exports combined with insignificant imports. The Commission explained this one-way flux by the strong competitiveness of the Italian tissue paper industry compared to its neighbouring countries. Moreover, the question about an Italian geographic reference market could be kept open, since even on a narrow (national) market definition, the proposed merger gave no rise to competition concerns.

<sup>97</sup> Case IV/M.623 Kimberly-Clark/Scott, (1996) OJ L 183/1, at para. 72. Unfortunately, the exact figures – including a price comparison of average UK against other European wholesale prices – were again missing from the decision.

<sup>98</sup> Id., at para. 75.

**Table 6.** Price Comparison of Average UK and European Retail Prices

<b>Branded products</b>	<b>Average UK price</b>	<b>Average EC price</b>	<b>% price difference</b>
Toilet tissue	0.575	0.358	160.6
Kitchen towels	0.747	0.601	124.9
Handkerchiefs	0.241	0.114	211.4

Nonetheless, the Commission suspected that such price comparisons misleadingly inflated UK prices.<sup>99</sup> Price comparisons based on net revenue per ton (as provided by the parties) or price comparisons based on price per roll (as provided by Nielsen) did not take proper account of the paper quality, and were hence biased towards the UK market that exhibited a significant preference (61.2%) to the premium segment of toilet tissue, which was also the most expensive. A simple price comparison across Member States was rendered, in the Commission's view, complex, but its final conclusion remained that the UK and Irish prices were higher than in Continental Europe. It seems that this data, coupled with other pieces of evidence, pointed to the geographic distinction of UK and Ireland.

It should be reiterated, however, that relying on absolute price comparisons for defining relevant markets is precarious. Absolute price comparisons provide indirect evidence at best, and are inadequate in answering the market definition question directly, that is whether other regions outside the provisional market are able to effectively constrain a 5% increase in the price of the product under investigation. Such a question was not raised by the Commission, though in light of the transport cost and trade flow data, the geographic borders as delineated were presumably correct.

A third quantitative indication for the width of the relevant market was afforded by the exchange rate shock in 1992,<sup>100</sup> caused by the British Sterling's departure from the exchange rate mechanism. In determining market boundaries, the Commission took notice of that event,<sup>101</sup> which provided an opportunity to assess whether competitive pressures outside the UK were sufficient to push prices back to their normal levels. If the market, as advocated by the parties, was indeed West Europe rather than local, supply from the UK was supposed to expand to the continent and vice versa, bringing prices back to relative uniformity.

<sup>99</sup> Id., at para. 78.

<sup>100</sup> See also the discussion at Lexecon Ltd. (1999), *op. cit.*, at 19.

<sup>101</sup> Case IV/M.623 Kimberly-Clark/Scott, (1996) OJ L 183/1, at para. 73.

Nevertheless, considering: (1) the generally high prices of UK and Irish tissue products which persisted albeit the 1992 shock, (2) the data on the transnational flow of tissue products from 1994 (2 years after the shock) which implied that Irish imports and exports were almost entirely with the UK, whilst the most important destination of UK exports was Ireland, and (3) the lack of other evidence to suggest that household tissue market boundaries were larger, the Commission's intuition for the UK/Irish geographic separation was further reinforced.

## **5.6 Carnival Corporation / P&O Princess<sup>102</sup>**

### **5.6.1 Facts and Judgement**

The cruise ships merger investigation involved two competing bids for P&O Princess Cruises (POPC), the third largest cruise company in the world: a friendly proposed alliance between Royal Caribbean and POPC, and a hostile tender offer for POPC by Carnival Corporation. Royal Caribbean and Carnival were the second largest and the largest cruise companies in the world, respectively.<sup>103</sup> The transactions were scrutinised simultaneously by three different competition authorities: the U.S. Federal Trade Commission (FTC),<sup>104</sup> the UK Competition Commission (CC)<sup>105</sup> and the European Commission.<sup>106</sup> The proceedings initiated by the European Commission concerned the POPC/Carnival merger, relating to the provision of oceanic cruises for vacation purposes, and its implications for the markets of UK, Germany, Italy, France and Spain.

The cruise ships industry had expanded significantly since its origins in the 1960s, evolving from a means of transportation into leisure cruising, and comprising 'mega ships' constructed by the largest companies, together with second-hand ships operated by smaller companies, all acquired and chartered on an international basis. This industry had experienced in recent years an immense growth compared to other types of vacations, shipping over 7 million cruise passengers worldwide in 2001 (72% out of which were North Americans, 20% European and 8% Asian), and anticipating further enlargement in the future. However, the nature and characteristics of cruise operation in different countries tends to vary significantly. For example, in 2000 Carnival had a very

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102 Case COMP/M.2706 Carnival Corporation/P&O Princess, (2003) OJ L 248/1.

103 The fourth largest player worldwide was Star Group.

104 Statement of the FTC concerning Royal Caribbean Cruises, Ltd./P&O Princess Cruises plc and Carnival Corporation/P&O Princess Cruises pl., FTC File No. 0210041 (2002) (hereinafter: "FTC Statement").

105 P&O Princess Cruises plc and Royal Caribbean Cruises Ltd: A Report on the Proposed Merger, Cm 5536 (2002) (hereinafter: "UK CC Report").

106 Case COMP/M.2706 Carnival Corporation/P&O Princess, (2003) OJ L 248/1.

high passenger share in Italy in the range of 50-60% but only 0-10% in the UK, whereas POPC had less than 0-5% in Italy and 15-25% in the UK. Moreover, while 1.25% of British citizens cruised in 2000, much lower penetration rate (0.4-0.5%) was observed in Germany, Italy and France, and below 0.2% in Spain.

Different nationalities exhibit distinct preferences, attributed to divergent national holiday traditions, language, tastes and preferences (e.g. with respect to timing, dining or drinking). Countries also exhibit differences with respect to their distribution channels (mostly cruise agencies and travel agents working on a national basis), in their marketing and promotions specifications, in their pricing strategies and in the cruise brands prevailing at each country.

Consequently, although cruise ships are international in the sense that they are generally untied to a particular region or itinerary and may be marketed worldwide, predominantly through the Internet, the Commission had established that the relevant geographic markets for oceanic cruises, i.e. a journey of a multi-night sequence on board a ship undertaken for leisure purposes in maritime water, were national (namely cruise holidays that are provided to customers of a single nation by operators from a wide range of countries).<sup>107</sup>

The product market definition presented much more perplexing dilemmas. In particular, two key elements needed to be considered in analysing the cruise industry. First, the degree of substitution between different types of cruises, and second, the position of cruise vacations within the wider vacation market. Between cruises themselves, a range of possible market definitions can be contemplated. At the extreme, all cruise ships may constitute one single relevant market, implying that all the different types of cruises compete with each other for customers. Another possibility is that cruises must be broken down into separate market segments, based on quality, language or style. A regular division refers to three quality categories: 5-star or 'Luxury' cruises, characterised by a very high level of service, 'premium' 4-star ships with high level of service, and 'standard' or 'economy' class with 3-stars and below. Another type of segregation exists on a national basis, with cruises tailored for customers of one nationality or language, for example, British-style or U.S. style cruises, differing in their form of entertainment and décor.

Whichever of the above distinctions is made, the basic presumption is that cruise vacations do not compete with other types of holidays. Relaxing this presumption opens another wide spectrum of possible market definitions. One could think of cruises as part of the overall holiday market, competing with

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107 Id., at para. 26.

hotels or holiday parks for potential customers. Alternatively, cruises could be grouped with other types of holidays of the same quality, assuming for example that customers are willing to substitute 4-star hotels with premium cruises. Naturally, in each one of these tentative markets the parties would be assigned different market shares. Hence market definition as a pre-cursor for market shares captured a critical role in this investigation.

As with other mergers, the parties' interpretation of the relevant market was broad, relating to the provision of leisure travel, a definition which grouped together a wide variety of alternative vacation options, including a stay in a holiday club or an all inclusive hotel resort, a package holiday, a skiing holiday or an organised tour in an exotic location. The Commission's investigation, on the other hand, identified a number of elements differentiating oceanic cruises from holidays of another sort:<sup>108</sup>

- (1) Characteristics of cruising and consumers' perceptions. Several sources in the cruising industry have pointed to a number of cruise-specific consumers' motivations to opt for a vacation of that type, in particular comfortable mobility by sea from one place to another, without the necessity for packing and unpacking, and combined with a special on-board conviviality. Moreover, travel agents indicated that most travellers who eventually bought a cruise vacation first requested a cruise brochure, whereas only a few first requested a foreign holiday package. This indicated that the decision to book a cruise vacation was largely taken prior to visiting the agent, and that cruise customers did not generally consider a different type of holiday; a finding reinforced by additional surveys submitted to the Commission.
- (2) Customer groups. In the Commission's view, the demographic spread of cruise customers differed to a considerable extent from other customer groups. The typical customer was said to be of an older age, retired, and more affluent than customers of land-based foreign package holidays.
- (3) Prices. Price data reflected that cruise holidays were priced considerably higher, more than twice as much as other holidays abroad.
- (4) Branding, marketing and distribution. The majority of cruise companies were specialised, and were not involved in the provision of other forms of land-based holidays. In the UK there were several extensions of other brands into cruising for a few upmarket brands such as Disney, Club Med and Radisson, but the latter accounted for less than 10% of the UK cruise market. Moreover, most cruises were advertised in designated brochures and marketed through distinguished travel agencies.

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108 Id., at para. 32-68.

- (5) Customers' booking patterns. The Commission utilised consumer surveys indicating that booking patterns differed somewhat for cruises and other forms of vacation. For example, the majority of cruises and independent vacations in 1999 were booked by the telephone, whereas inclusive and long-haul vacations were booked primarily by visiting in person. Moreover, cruises and independent vacations were booked in most cases through tour operators, while inclusive and long-haul vacations were booked via travel agents.
- (6) Views of travel agents and competitors. Travel agents testifying to the Commission generally conveyed that cruises belonged to a distinct product market, encompassing all distinct categories of cruises. Competitors expressed differing views, yet most of the parties' close cruise competitors stated that pricing decisions taken by them are constrained by the pricing of other cruise companies only, and that cruises constituted at the minimum one separate product market.
- (7) Empirical evidence on the impact of new capacity on yields.<sup>109</sup> Two reports submitted to the Commission attempted to investigate the relationship between yields from cruising, capacity additions and market definition. Both reports advanced the result of a market broader than cruises themselves. Nonetheless, the Commission rejected the proposition of a wider relevant product market, and concluded that the latter was merely confined to the supply of oceanic cruises.

Concerning the possible segmentation between different types of oceanic cruises, the Commission has reached the following conclusions.<sup>110</sup> First, for any one of the investigated locations (UK, Germany, Spain, Italy and France), premium cruises should not be separated from economy cruises for the sake of market definition. Second, the question whether luxury cruises constituted a distinct relevant market could be left open, due to the small size of the luxury segment, and since the parties' activities did not overlap. Third, river cruises and coastal ferry cruises did not belong to the same product market as oceanic cruises. Fourth, it was left open to decide whether oceanic niche cruises (sail cruises and explorer cruises) should be separated from oceanic cruises.

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109 The notion of yields is associated with revenues, and was defined as the (weighted) average of achieved ticketed revenue per passenger bed days across all POPCs cruises departing to a given destination during a particular month.

110 Case COMP/M.2706 Carnival Corporation/P&O Princess, (2003) OJ L 248/1. at para. 69-111.



### 5.6.2 Assessment of the Commission Decision

The threefold investigation into the cruise ships merger, advanced simultaneously by the Commission, the U.K. CC and the U.S. FTC, provides an important possibility for observing the underpinnings of market definition in competition law analysis in particular, and the role of economic analysis in general.

Stemming from the presumption governing large transactions, that concentration-enhancing mergers in an already concentrated market are likely to create anti-competitive effects, a key threshold issue in the investigation was how to define the relevant market. The delineation of the relevant market carried the potential to immensely affect the competitive position of the merging parties, depending on the breadth of the lens chosen. The UK CC investigation, for example, deduced that the merged entity would hold a share in excess of 60%, if the market comprised of 'UK style premium cruises'. This share would have fallen to 30% if 'standard (economy) cruises' were added to the definition, and to around 1% upon the inclusion of all 'foreign inclusive holidays' in the relevant market.<sup>111</sup>

As is frequently the case, the qualitative evidence laid before the three competition authorities was not conclusive on whether the hypothetical monopolist test would pass or fail, and did not allow a clear-cut delineation of the market. To see that, note that while the FTC and the European Commission found the market only to compose of oceanic cruises, the UK CC was unable to come to a single view on the market definition issue, and left the question open.<sup>112</sup> In such circumstances, economic analysis carried the potential to serve a useful tool. Whilst all three competition authorities eventually concluded not to challenge the mergers, they differed in their mode of analysis, allowing interesting observations into the ways the exercise of market definition has been tackled.

In what follows, the approach undertaken by the antitrust regulators to market definition is critically appraised. First, the European Commission's decision is examined, in particular its adherence to old-style definitions and the problems related thereto. Second, the quantitative evidence presented in the case is scrutinised. Finally, the Commission's approach is compared with its UK and U.S. counterparts.

The European Commission analysis of the closeness of competition between the merging parties was predominantly qualitative, encompassing observed

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111 Note that these figures were calculated for the POPC/Royal Caribbean merger. See UK CC Report, at Chapter 5 Table 5.6.

112 Id., at Chapter 2 para. 2.64.

consumers' preferences together with a comparison of product characteristics, prices, views of competitors and other market conditions. Particularly with regards the relevant geographic market, the Commission identified national markets for oceanic cruises with reference to product characteristics only, listing factors as distribution, marketing and pricing strategies<sup>113</sup>. Such evidence, while shedding light on the underlying constraints, is hardly informative on whether the hypothetical monopolist test would pass or fail, and does not immediately allow a precise delineation of market boundaries. Unfortunately, to the extent that market definition should be conducted in light of the SSNIP methodology, the following statement conveys the essence of the Commission's approach:<sup>114</sup>

“The Commission has, however, been unable to gather data that would enable it to perform any quantitative tests on the boundaries of the relevant market. When such data is available empirical tests such as the SSNIP test can be done to try to establish how customers would react to a change in relative prices of the products in question ...”.

This terminology requires further attention. As discussed in length in previous chapters of this book, the so-called ‘SSNIP-test’ cannot itself be considered merely a test, but rather a conceptual framework within which market definition is addressed. Such a framework may be implemented throughout the employment of quantitative tests, but also on a qualitative level when empirical data is lacking. Either way, the important issue is to recognise the set of products which effectively constrain pricing of the products under scrutiny, in order to identify all relevant participants under the ‘hypothetical monopolist’ umbrella. With respect to cruise ships, of main interest would be to inspect whether consumers viewed other forms of holidays as sufficiently strong substitutes, such that they would willingly alter their choice of vacation upon an incremental increase in the price of cruising. It is ostensibly unquestionable that a cruise vacation differs in many respects from other forms of holidays, as contended by the Commission. Cruises were shown to reflect different demographics,<sup>115</sup> cruises were priced much higher,<sup>116</sup> and were featured by a particular mode of booking.<sup>117</sup> Yet, dissimilarity in characteristics has long been regarded an inadequate indicator for the degree of competition, especially in a differentiated product environment. It is therefore imperative to invoke the SSNIP test as a tool aiding the market definition puzzle.

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113 Case COMP/M.2706 Carnival Corporation/P&O Princess, (2003) OJ L 248/1, at para. 26.

114 *Id.*, at footnote 10.

115 *Id.*, at para. 45 Table 1.

116 *Id.*, at para. 48 Table 2.

117 *Id.*, at para. 56 Tables 3a and 3b.

At the subtext of the decision, there are some indications suggesting that the Commission did consider the feasibility of substitution between cruises and other holidays. For example, a survey submitted to the Commission by Royal Caribbean indicated that only 18% of cruise customers (i.e. less than one in five people), both in the premium and economy segments, considered taking an alternative type of holiday. In this context, the Commission stated:<sup>118</sup>

“Unfortunately, the researchers did not ask whether the respondents would have considered an alternative had relative prices between cruises and alternatives been any different”.

Likewise, when discussing another survey showing that 85% of cruise customers have taken the decision to cruise prior to contacting their travel agent, the Commission noted:<sup>119</sup>

“This indicates that there is only limited competition and substitutability between cruises and other forms of holidays at the point when customers make contact with travel agents”.

However, these minor references do not amount to the complete and coherent methodology dictated by the SSNIP test. Despite the intensity of data presented in this case, the Commission attempted neither to seriously contemplate consumers’ response to a price increase, nor to quantify its effect. As an illustration of this proposition, consider for instance that the Commission disregarded POPCs submission, which indicated that price was a very important reason for taking a cruise.<sup>120</sup>

Moreover, a study by Mintel (commissioned by Carnival) provided the following insights: (a) cruises were increasingly integrated into holiday packages including land-based components; (b) the average age of cruisers tended to fall and cruises were adapting to younger customers’ needs; (c) prices of cruises were declining in real terms; and (d) cruise customers also took holidays other than cruises.<sup>121</sup> However, the Commission disputed the abovementioned contentions insofar as age and prices were concerned and in general discounted the arguments in favour of enlargement of the cruise market into land-based alternatives.<sup>122</sup>

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118 Id., at para. 41.

119 Id., at para. 42.

120 In the Commission’s wording, “the price argument is very general”. Id., at para. 34.

121 Id., at para. 36.

122 Id., at para. 37.

A second study submitted by Carnival and prepared by IRN research implied that interchangeability existed between land-based and cruise holidays, as 50-80% of cruise customers considered also a land-based holiday. This evidence too was discredited as being inconclusive as for “whether such consideration involved active comparisons of prices, itineraries, etc which led to the choice of a cruise or whether respondents decided to go on a cruise before getting more information on cruises”.<sup>123</sup> Even if the Commission’s view is accepted, and the decision to go on a cruise is largely predetermined before ever reaching a travel agent, this need not imply that a consumer’s choice of vacation is entirely independent of the price. The important question, how consumers would react to a change in cruises’ price, remained therefore unanswered.

The only quantitative evidence presented in this case, which could potentially shed light on the problem of market definition, included two empirical studies submitted by the parties dealing with the relationship between capacity and yields in the cruising industry.<sup>124</sup> The latter comprised a report on behalf of POPC prepared by NERA Economic Consulting, and a report by Carnival prepared by Margaret E. Guerin-Calvert and Janusz Ordover. Both studies aimed at translating the relationship between yields and capacities into a conclusion about market definition, in light of the significant capacity expansion that the industry witnessed since 1995. In principal, the substantial increase in capacity was expected to come at the expense of profitability. Yet the NERA report found that while cruise capacities had increased substantially over the years, yields have remained generally stable during that period. NERA’s findings implied that cruises belonged to a larger holiday market. Significant capacity expansion unaccompanied by large yields reductions, according to this line of reasoning, was accomplished since cruises captured volume formerly held by other types of holidays. Similar results were drawn from the Ordover report. As profits and prices did not tend towards depression despite the considerable expansion in industry size, it was concluded that the relevant market had to be broader than merely cruising.<sup>125</sup>

The Commission, however, criticised the above corollaries. As for NERA, it contended that yields could possibly have been unaffected by capacity changes, if one assumed that premium cruises in the second half of the 1990s belonged

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123 *Id.*, at para. 38.

124 *Id.*, at para. 60-67.

125 Note that the question asked by such studies differs somewhat from the SSNIP question. The SSNIP test asks whether a price increase can be maintained profitably, and interprets a positive answer as indicative of the existence of a relevant market. The above studies basically asked whether an output increase could be maintained profitably, and interpreted a positive answer as indicative of a relevant market broader than cruising alone.

to a separate relevant market from economy cruises. That is, capacity expansion which mostly took place in the economy segment did not necessarily have to affect yields in the premium market. Alternatively, the lack of information about potential shifts in demand in the NERA study rendered it less useful for allowing a decisive conclusion on market definition.

As with NERA, the Ordoover analysis was criticised for only examining supply-side changes whilst neglecting the demand-size. In particular, the Commission argued that demand was actually likely to shift in light of Carnival's growing expenditure on marketing aimed at attracting demand for its cruises. Moreover, since the cost of marketing was lacking from the study's calculation of yields, its entire results were, according to the Commission, unreliable. The Commission did not therefore consider any of the above studies as indicative of the scope of the relevant market.

The Commission decision reflects some of the inherent difficulties associated with market definition, mostly with respect to the availability of data and the interpretation thereof. Data availability, especially of quantitative nature, depended to a large extent on the parties' submission throughout the course of the case. The evidence at hand in this case was not, however, convincingly decisive and irrefutable as to justify a broader market definition in the Commission's view.<sup>126</sup> The Commission, therefore, adhered to its long-standing tradition of defining markets according to their mere product characteristics.

A different message with respect to the contours of market definition is conveyed by the UK CC report dealing with the parallel merger between POPC and Royal Caribbean Cruises (RCC). The discussion of the relevant market commenced with an outline of the methods advanced by the CC to define the cruise market:<sup>127</sup>

“One way to define the market is through the ‘hypothetical monopolist’ test. The hypothetical monopolist test provides a framework within which to determine the set of products that currently provide competitive constraints on the merging firms, and the geographic area in which this occurs.

We start with the narrowest product or group of products of interest and assess whether a single supplier that controlled all these products could increase its profits

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126 This raises the intricate question of the adequate standard of proof that should be applied to economic evidence. The issue is discussed at O. Budzinski and A. Christiansen, *Simulating the (Unilateral) Effects of Mergers: Implications of the Oracle/PeopleSoft Case* (August 15, 2006); G. Aigner, O. Budzinski and A. Christiansen, *The Analysis of Coordinated Effects in EU Merger Control: Where do we stand after Sony/BMG and Impala?*, 2 *European Competition Journal* 311 (2006).

127 UK CC Report, at Chapter 5 para. 5.4.-5.5.

by a sustained raising of prices by around 5 to 10 per cent. The ability of such a hypothetical monopolist to do so hinges on the extent to which consumers would turn to other products, and on the ability of suppliers of alternative products to switch production without significant investment or delay in response to the hypothesised price rise. The set of products over which the hypothetical monopolist can exercise its monopoly is expanded until a group of products that can sustain a hypothetical 5 to 10 per cent price rise is found. These are seen as constituting the relevant economic market as their prices are not substantially constrained by those of other products”.

Moreover, while not explicitly utilised during the investigation, the UK CC invoked the concept of critical loss to launch its discussion on the boundaries of the relevant market. Despite stating that an empirical application of the test cannot be carried out as necessary data was unavailable, it did present the critical loss figures, mentioning that:<sup>128</sup>

“... we have found it useful to provide some guidance in estimating the proportion of customers an individual cruise operator would be able to lose after a 5 to 10 per cent price increase and remain as profitable. Based on Tables 4.4 and 4.12 reporting the financial performance of POPC and RCCL respectively, we have estimated this fall in passenger numbers to be around 9.5 to 11.5 per cent if prices were raised by 5 per cent, and to be around 17.0 to 21.0 per cent for a hypothesized 10 per cent price increase...though fully aware of its limitation, we found this estimate a useful benchmark against which to compare views on customers’ likely responsiveness to price changes, and thereby assess the profitability of a 5 to 10 per cent price rise”.

Against this background, the investigation proceeded to consider how demand-side substitution and supply-side substitution may affect the definition of the market. Whilst this part of the analysis was carried in a more qualitative manner, it seems that the correct question pertinent to the SSNIP was posed:<sup>129</sup>

“(a) what evidence there is of demand-side substitution—taking destination as an example, we will consider how readily passengers will switch from a cruise in the Caribbean to one in the Mediterranean if the relative prices of the two change; and (b) what evidence there is of supply-side substitution—again, taking destination

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128 *Id.*, at Chapter 5 para. 5.6. Appendix 5.1 provides a full description of how these estimates were derived.

129 *Id.*, at Chapter 5 para. 5.9.

as an example, we will consider the ease with which cruise operators can change itineraries”.

The UK CC subsequently addressed a wide range of relevant considerations, including destination (e.g. South America, Round the World), day and place of departure (e.g. weekday versus weekend departures), duration, on-board experience and prices. Yet when it came to drawing the final conclusion, the UK CC was puzzled by the complexities presented by market definition. Though it acknowledged the existence of a significant restraining effect by other types of holidays, the UK CC ultimately refrained from establishing that cruises operated within a wider holiday market.<sup>130</sup>

“We have not been able to come to a single view on these issues. Some of us considered that cruises are part of the wider holiday market, while others prefer the view that cruises constitute a separate market, or series of markets. What we did all agree on, however, was that the existence of other types of cruises outside the categories in which POPC and RCCL operate, and the presence of the wider holiday market, both constrained these companies’ actions and limited their commercial freedom, to varying degrees, whether or not they were regarded as being in the same markets. Likewise, we all agreed that there were clear distinctions between different quality levels and national styles, whether or not they constitute different markets. So in the rest of this report we draw attention to some or all of these wider considerations to the extent that seems to us appropriate in particular cases”.

Whilst both the European Commission and the UK Competition Commission relied heavily on qualitative analysis to construct a market definition, the U.S. Federal Trade Commission promulgated an economic based approach to structure the issue. Market definition under the U.S. Merger Guidelines is based upon demand responses to a price increase imposed by a hypothetical monopolist. In assessing the profitability of such price increase empirical evidence calibrated by the FTC economic staff played a key role. This consisted of demand estimation and critical loss analysis. In light of the high elasticity of demand found in the cruise industry relative to the critical loss, the FTC deduced that an across-the-board price increase would be unprofitable and unlikely, in which case a broad market definition seemed appropriate. Yet cruises were eventually treated as a distinct relevant antitrust market, since the FTC concluded that a hypothetical cruise monopolist “could likely use yield management systems to mitigate this

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130 *Id.*, at Chapter 2 para. 2.64.

effect and thus likely raise average prices profitably”.<sup>131</sup> Assuming that cruising was therefore a market, the transactions would present a merger of two of the four major competitors in an industry provoking a high degree of concentration and triggering antitrust concerns. However, in the view of the FTC, the evidence at hand did not support a conclusion that any one of the proposed mergers would exacerbate the risk of unilateral anticompetitive effects. After the transaction there would still be two large competitors in the market and a substantial fringe that would constrain any unilateral actions by the merged entity, for example, through building new ships, or competing with product offerings and marketing. Consequently, the FTC closed its investigation without challenge.<sup>132</sup>

These latter propositions merit further discussion. From the outset, the FTC was interested in establishing the position of cruises within the overall vacation market. Similarly to its European counterparts, the FTC too has confirmed, based on qualitative considerations, that the cruise industry was rapidly expanding, exhibiting an increased affordability accompanied by a growing share of the all-vacation market. On the other hand, cruising was not expected to completely overtake other forms of holidays. Many holiday purchasers have never cruised before. Even frequent customers used to cruise only every couple of years, in between they repeatedly switched back to different types of vacations. It was therefore assumed that the demand for cruising was fairly elastic. Put differently, cruise customers would readily switch their choice of vacation upon a cruise price increase.

This result was reinforced by empirical analysis. During 2000 and 2001, the cruising industry experienced an exceptionally large increase in capacity. This served as a ‘natural experiment’, allowing some general conclusions as to the nature of demand for cruising. As the analysis revealed, the cruise industry had been able to absorb this large increase in capacity over a very short period of time, with hardly any impact on capacity utilisation and on prices. The fact that prices were only moderately reduced during the relevant period, and that the excess capacity was promptly assimilated, implied that cruises belonged to a broader vacation market.<sup>133</sup>

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131 FTC Statement, at part IIA.

132 For an overview of the case see J.J. Simons, Merger Enforcement at the FTC, Keynote Address to the Tenth Annual Golden State Antitrust and Unfair Competition Law Institute, California (October 24, 2002). Available at: <http://www.ftc.gov/speeches/other/021024mergeenforcement.shtm>.

133 M. T. Coleman, D.W. Meyer and D.T. Scheffman, Economic Analyses of Merger at the FTC: The Cruise Ships Mergers Investigation, 23 *Review of Industrial Organization* 121, 132 (2003). Interestingly, a similar conclusion was drawn by the NERA and Ordo reports, which were rejected by the European Commission.



Moreover, the FTC was able to generate a crude estimate of demand elasticities, approximated at -2 or greater in absolute terms,<sup>134</sup> which verified that demand was indeed highly elastic: any 1% increase in price by the hypothetical monopolist would result in more than 2% decrease in sales.

To complement its analysis of demand, the FTC employed a critical loss analysis, relating to the amount of sales loss (i.e. the number of customers lost) by a hypothetical cruise monopolist that would render a price increase unprofitable. As it appeared, the critical loss figure tended to be extremely small, associated with the fact that most costs of cruising were fixed, and only incremental margins came from passenger's on-board experience. Specifically, it was found that in order for a hypothetical monopolist to increase price profitably, its margins would have to be lower than 50%. Such margins are well below short-run cruise ships margins, therefore indicating that any across-the-board price increase would certainly fail.<sup>135</sup>

Taken together, such evidence would have suggested that the proposed narrow market definition was economically unjustified, since it implied that alternative types of vacations provided effective substitutes for cruise holidays, and that cruises should be seen as a subset of an overall vacation market. However, due to the specific merits of the case the FTC asserted that a hypothetical cruise monopolist could potentially impose a price increase without surpassing the critical loss after all. In particular, the FTC withheld that the exercise of market power by cruise operators was still viable, and that yield management techniques<sup>136</sup> were likely to enable a hypothetical monopolist to profitably impose a price increase on its customers.<sup>137</sup> Cruises were therefore considered a separate antitrust market.<sup>138</sup>

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134 *Id.*, at 133.

135 *Id.* To answer common critiques of the critical loss analysis in this merger, the authors note that high-margins (which is the case in the cruise industry) can co-exist with high market elasticity of demand (although the Lerner Index links high margins with relatively low elasticities) in industries with high fixed costs and unilateral market power, and when capacity constraints exist.

136 This concept relates to the management of revenues, commonly used by cruise companies to improve their profitability. Generally speaking, yield management uses estimates of predicted load factors against actual load factors as one indicator for whether prices should be changed, together with information about prices charged by competitors. For example, if actual load factors are low relative to the prediction and competitors' offerings are low, a cruise company may consider lowering its prices in order to increase its load. See FTC Statement, at footnote 9.

137 That it is not to say that the parties would actually abuse their post-merger market power. Market definition merely concerns the potential to do so. Since yield management techniques would likely enable a hypothetical monopolist to raise its prices profitably, cruises in the FTC view had to be considered a single market. Yet at later stages of the investigation the FTC concluded that the merging parties were unexpected to abuse their market position in reality.

138 The above market definition construct may be criticised on the grounds of blurring the boundary between market definition and the ensuing competitive assessment. Since the FTC ascertained and empirically supported that cruises were effectively constrained by non-cruise vacations, omitting

Notably, the economic analysis carried out by the FTC consisted of “very large but straightforward reviews of prices and similar information, not complex, technical econometric work”.<sup>139</sup> Yet it usefully highlighted important aspects with regards the competitiveness of the cruise industry, and provided solid grounds for market definition. Such an explicit and enthusiastic approach to the role of economics in competition analysis was reflected to a lesser extent in the UK CC decision, but was entirely missing from the European Commission’s analysis, which made no attempt to relate to or quantify the impact of a hypothetical price increase.

## **5.7 Blackstone / Acetex<sup>140</sup>**

### **5.7.1 Facts and Judgement**

Blackstone was a U.S. merchant-banking company, involved in the chemical business through Celanese, one of the companies it controlled. Acetex was active in the acetyls and plastic business. The parties’ activities hence overlapped with respect to the provision of several chemical products: acetic acid, an intermediate chemical product used in the production of various other chemicals; vinyl acetate monomer (VAM), a commodity chemical derived from acetic acid; acetic anhydride, a chemical used for the production of cellulose acetate flake; and polyvinyl alcohol (PVOH), a water-soluble synthetic polymer. According to the Commission’s investigation, these four products constituted basic building blocks for downstream products, which could not be substituted by any product in the market. In that vein, the Commission defined a separate relevant market for every one of these products.

As for the respective geographic market definition, the parties and the Commission diverged on what constituted the relevant market for acetic acid, VAM and acetic anhydride.<sup>141</sup> In particular, the issue was whether the market was worldwide, as the parties contended, or only EEA wide. To support their proposition, the parties advanced the following arguments:<sup>142</sup>

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the latter from the relevant market may potentially subtract important sources of competition from subsequent parts of the assessment. See RBB Economics, *Goldilocks and the Three Bears – the Story of Market Definition and the Cruise Mergers*, Brief 11 (October 2003).

139 Simons (2002), *op. cit.*, at part III A.1.

140 Case COMP/M.3625 Blackstone/Acetex, (2005) OJ L 312/60 (notified under document number C (2005) 2672).

141 The market for PVOH was already considered by the Commission in a former decision. It was therefore assumed to be global for the sake of the current investigation.

142 Case COMP/M.3625 Blackstone/Acetex, (2005) OJ L 312/60, at para. 26.

- (1) Imports into Western Europe were significant.
- (2) Transport costs, import duties and national regulations did not inhibit the worldwide trade of the products concerned.
- (3) Major global producers supplied Western Europe solely through imports.
- (4) Global trade flows seemed to shift freely among Asia, Eastern Europe, Western Europe and North America in response to changes in local supply and demand.
- (5) Prices appeared to be highly correlated across geographic regions worldwide.

In order to establish the existence of a global geographic market, the parties submitted several econometric studies. Those included price correlation analysis, which examined price movements for each product across different geographic locations, and shock analysis, which studied the impact of unexpected plant outages on trade flows. Complemented by the Commission's own empirical analysis, the investigation verified and generally confirmed the parties' position; it concluded that the geographic market for the products at hand were indeed global.

The following paragraphs address the quantitative techniques utilised in this case to resolve the question of market definition. In particular, since the Commission performed a separate economic analysis – not a routine procedure in its investigations – a careful inspection of its practicalities, and a comparison with the parties' submissions, will be insightful.

### 5.7.2 Assessment of the Commission Decision

The Commission conducted a distinct analysis for each relevant product market in a rather similar manner. For acetic acid, it began by discussing imports into Western Europe, displayed in the following table:<sup>143</sup>

**Table 7.** Acetic Acid Imports into Western Europe

	2001	2002	2003	3-year average
Total imports (ktonnes)	262.1	328.1	303.7	298.0
% of total demand	19%	23%	20%	20%

<sup>143</sup> Id., at para. 29. The table is based on an independent study by Tecnon OrbiChem, relied on by the parties as well as by the Commission.

As can be seen from the table, imports satisfied on average 20% of Western European demand, and these figures were anticipated to rise over the long term. In particular, whereas demand was expected to increase, no new acetic acid plants were planned in Western Europe, and the region would likely be provided with new capacities from the by Middle East and Asia. Moreover, the investigation confirmed that major global acetic acid producers already supplied Western Europe solely through imports from other regions.

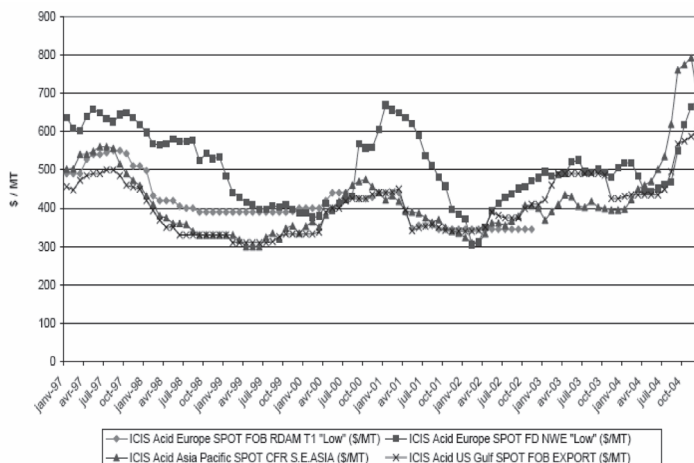
As for trade flows between Asia, Eastern Europe, Western Europe and North America, the Commission found that Western Europe was mostly provided by imports coming from North America (60%), and to a lesser degree from Eastern Europe (23%) and Asia (14%). In addition, data reflected that trade flows between the different regions have been subjected to significant fluctuation. For example, in 1999 North America imported to Asia 64% of its total consumption, in 2001 this figure went down to 45% and rose to 85% in 2003. Likewise, exports from Asia into Western Europe changed from less than 1% in 1999, to 22% in 2001 and 14% in 2003.<sup>144</sup> According to the parties, these fluctuations pointed to the ease with which acetic acid could circulate around the globe, and hence its ability to restrain regional price increases. Namely, any attempt of a local producer to increase price could be rapidly defeated through the unrestricted availability of importing alternative acetic acid into that region.

The proposition that prices of acetic acid were highly correlated across the globe was empirically tested by the parties in a price correlation analysis submitted during the proceedings, and undertaken by the economic consulting firm LECG. This study, analysing price movements of acetic acid around the globe, showed that product prices at different locations tended to move together, thus supporting the hypothesis of a global product market. This is demonstrated by the following figure, depicting price movements in different world regions:<sup>145</sup>

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144 Id., at para. 32 Table 2.

145 Id., at para. 37.

**Figure 2.** Comparison of Acetic Acid Price Trends across Regions

Within a period of 7 years, short-term prices of acetic acid were changed frequently, but generally reverted to a long-term equilibrium. This could be explained by the existence of trade flow, shifting between different locations to compensate for regional changes in supply or demand for the product, and pointed out to a global market definition.

The Commission, however, suspected that the high correlation detected by the parties might be spurious, and may be attributed to other common influences, such as shared costs, or a demand trend.<sup>146</sup> In order to defy the Commission's concerns, LECG submitted a second study, which included a cointegration and Granger causality analyses. To recall, Granger causality is an econometric concept used to assess the direction and degree of causality (in its statistic sense) between the variables under investigation. If, for example, region X and region Y form one relevant geographic market, a change in the price of the product in region X will have spillovers into region Y, and price data from both regions should indicate that the price in region X Granger-causes the price in region Y. Cointegration analysis in turn examines whether a stable long-term relationship exists between two variables. The test compares two price series and considers whether they revert to a constant value over time, assuming that if products are in the same relevant market, any drift would be rapidly corrected by market forces due to the competitive influence substitute products impose on one another.

<sup>146</sup> Id., at para. 35.

The tests performed by LECG showed that prices for acetic acid for different world regions were integrated, and exhibited a long-term relationship. Nonetheless, the Commission remained unconvinced by these results, and asserted that the basic model utilised by LECG was wrongly specified. In particular, it contended that the test as conducted indeed showed co-movement between prices, but failed to relate it to the relevant source of competitive constraint. As a result, the tests according to the Commission could not conclusively corroborate a global market for acetic acid.<sup>147</sup>

Moreover, though not explicit in the decision's wording, the Commission seemed to recognise that correlation and co-integration analyses are primarily designed to identify economic markets, the place where one price rules. They may answer the question whether prices (in real or relative terms) converge, but remain uninformative as to the definition of a relevant antitrust market. This analysis merely refers to the extent to which a producer at one location can afford to increase the price profitably, without suffering a devastating reaction from consumers seeking to buy elsewhere, or from alternative foreign suppliers. As was aptly recognised by the Commission's Chief Economist Team:<sup>148</sup>

“In fact, the relationship between prices in two distinct regions does not necessarily provide sufficient information about the elasticities needed to determine the relevant antitrust market. In the present case, information about the elasticities of supply of the different groups of producers would have been helpful to delineate the relevant geographic market. In sum, the empirical studies submitted did not directly provide evidence that the producers in different regions belong to the same antitrust market”.

Importantly, it is evident from this statement that the Commission now considers the SSNIP as the appropriate framework to govern its market definitions. Whilst older cases uncritically utilise price analyses, the current decision elucidates that demand elasticities are the imperative concept underlying the relevant market. The decision thus makes it clear that the SSNIP test should be equally applied to the relevant geographic market.

To enhance their standpoint, the parties further submitted additional economic studies analysing the effect of unexpected ‘plant outages’, a term relating to losses of production due to breakdowns or shortages of raw materials.

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147 Id.

148 B. Durand and V. Rabassa, Directorate-General Competition, Chief Economist Team, *The Role of Quantitative Analysis to Delineate Antitrust Markets: An Example*. Blackstone/Acetex, 3 Competition Policy Newsletter 118 (2005).

Unexpected plant outages provide a natural and transitory ‘shock’ to supply in a certain region, because of the negative impact on supply following the shock. Observing whether such an event had any impact in other regions around the globe may shed light on the potential reactions by competing suppliers located elsewhere. For the purposes of market definition, discovering the competitive reaction to these short-run shocks may indicate on possible reactions to a non-transitory price increase, and may hence be informative in places where the SSNIP test cannot be directly implemented.

The first study provided an analysis of the effect of plant outages on the prices of acetic acid. It established that plant outages in one region affected prices in another region, and in particular, that plant outages in Asia had an impact on Western European prices.

In a second study, the parties examined the impact of unexpected plant outages on trade flow between regions, and showed that North American producers enjoyed a prominent excess capacity (by which capacity largely exceeded demand), which allowed them to re-direct their exports between different world locations according to profit considerations. The study concluded therefore that the relevant market was global.

The Commission, however, identified some caveats in the above conclusions. First, it correctly noted that whilst the parties’ submissions, which concentrated on Asian outages, identified an impact of Asian plant outages on Western European prices, no parallel pattern was detected in the other direction, namely plant outages in Europe were not found to have an impact on Asian prices.<sup>149</sup> Finding that a shock in one region had some effect on prices in another region is insufficient to generally conclude that the market is worldwide. Second, the Commission asserted that whereas the second study highlighted the potential constraint exerted by North American producers on other regions, it remained indecisive as to the magnitude of the competitive constraint exerted by Asian producers on the EEA market.<sup>150</sup>

Hence, the Commission undertook to perform an independent study and conduct additional statistical tests to quantify the effect of unexpected plant outages on prices and on trade flows.<sup>151</sup> Recognising that the primary concern was to determine whether the merger would induce an EEA price increase, the

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149 Case COMP/M.3625 Blackstone/Acetex, (2005) OJ L 312/60, at para. 36.

150 *Id.*, at para. 39.

151 The Commission’s own investigation was carried out by its Chief Economist Team. See Durand and Rabassa (2005), *op. cit.*

Commission's investigation focused on the impact of unexpected plant outages that have occurred in Western Europe (a proxy for the EEA):<sup>152</sup>

“Therefore the starting point of the exercise is to determine if the EEA constitutes a geographic market that can be successfully monopolized. Unexpected outages, though short-lived, may provide some indication about the source of the competitive constraint faced by producers located in the EEA. That is, if unexpected output restriction causes both a surge in imports into the EEA and prices in other regions to rise, this would be an indication that a hypothetical monopolist controlling all production facilities in Europe would be unlikely to impose a successful small but non-transitory price increase. As a result, the antitrust market would likely be broader than the EEA”.

The econometric experiment revealed that unexpected plant outages in Western Europe had a positive and statistically significant impact, both on prices in Western Europe and on prices in North America, though the former effect appeared stronger.<sup>153</sup> Such results were interpreted by the Commission's Economic Team as implying that the decline in output following an outage in Europe increased the demand for the product there, and encouraged imports from North America. These imports did not suffice to fill the European shortage, hence stimulating the observable European price increase, and at the same time causing a North-American shortage in supply, which led to price increases there too. A complimentary econometric analysis conducted by the members of the Economic Team, modelling imports into the EEA, verified that unexpected plant outages originating in Western Europe had positively affected imports into the region, especially from North America.<sup>154</sup>

Taken together, these results established that North America provided a significant competitive constraint on Europe, and strongly suggested that any potential European price increase would be defeated in the face of North American imports. The Commission was therefore able to draw the conclusion that the relevant geographic market for acetic acid must include at least the EEA and North America. However, the data on the effect of the above outages in Asia was insufficient to infer that the region should be included in the relevant market as well.<sup>155</sup>

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152 Id., at 120.

153 Id., at 120 Table 1. The authors provide results only for one set of products, VAM, but the conclusions drawn for acetic acid were identical. See Case COMP/M.3625 Blackstone/Acetex, (2005) OJ L 312/60, at para. 41.

154 Durand and Rabassa (2005), *op. cit.*, at 121.

155 Eventually the market was assumed by the Commission to become global, in light of the planned capacity expansion in Asia.



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In conclusion, the openness exhibited by the Commission in this case is notable for two reasons. First, by reviewing and extending the parties' designated studies, the Commission was able to verify that the EEA clearly did not form a separate geographic market. This approach to the market definition exercise promotes accuracy in competition analysis, and allows the Commission to distinguish appropriate from inappropriate provisional markets. In the case at hand, economic analysis enabled the Commission to rule out the EEA as a single market, and indicated that market boundaries should be broadened. Second, the Commission performed an independent economic analysis, critical of the one undertaken by the parties, which represents a shift away from its customary inclination to rely on parties' submissions throughout the proceedings. The expert Economic Team was able to provide valuable insights into the competitive assessment, thereby contributing to the quality of the Commission's analysis and to legal certainty, and encouraging parties in future litigations to use economic analysis as a yardstick for their argumentations. It is therefore left to hope that this case signifies a positive change in the Commission's approach, further increasing the harmony between economic analysis and legal thinking.



## Chapter 6

# Conclusions

### 6.1 A General Overview

Market definition is the focal point of nearly all competition law investigations. Accordingly, it is the primary interest of this book. Defining the relevant anti-trust market “is the first and, in many respects, the most important question in legal analysis”,<sup>1</sup> as it affects the legal issues that will be addressed, and ultimately determines the outcome of the case. Overly-inclusive market definitions may underestimate a firm’s ability to exercise its market power, hence carrying the risk of acquitting anti-competitive conduct or transactions. Overly-narrow market definitions on the other hand will tend to result in false convictions and an overestimation of the competitive harm caused by the firm’s actions. Therefore, a correct resolution of the relevant market is crucial to ensure that welfare-enhancing practices are approved, whilst welfare-reducing practices are restrained.

Nonetheless, an inherent difference seems to exist in the way legal and economic practitioners view the market definition exercise.<sup>2</sup> For lawyers and judges, market definition is a legal prerequisite within the competitive assessment, one which opens up and often captures the bulk of any discussion of market power. Market definition is hence the first step in a structural judicial process, further comprising of a calculation of market shares and concentration, and an analysis of entry condition into the market. The economic approach to market definition is, however, somewhat different, and relates to the distinct interpretation of the concept of market power in economics discussions. Whilst the legal definition for market power is somewhat vague, concentrating on the ability of an undertaking to act independently in the market,<sup>3</sup> the economic definition emphasises

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1 R.J. Van den Bergh and P.D. Camesasca, *European Competition Law and Economics, A Comparative Perspective*, Sweet & Maxwell (2<sup>nd</sup> ed., 2006), at 106.

2 In fact, as one commentator has pointed out, there is “is a fundamental distinction between the methodologies applied by lawyers and economists respectively to competition cases”. See M. Hutchings, *The Competition Between Law and Economics*, 25 *European Competition Law Review* 531 (2004).

3 In the wording of the European Court of Justice: “... a position of economic strength enjoyed by an undertaking which enables it to prevent effective competition being maintained on the relevant market by affording it the power to behave to an appreciable extent independently of its competitors, its customers and ultimately of the consumers”. Case 85/76 *Hoffmann – La Roche v. Commission*, (1979) ECR 461, at para. 38. See also Case 27/76 *United Brands v. Commission*, (1978) ECR 207.

the individual firm's discretion to price its product above the competitive level. The degree of market power, according to this definition can be quantified,<sup>4</sup> and corresponds to the gap between the price and the marginal costs of production. Such a definition also elucidates that had the relevant figures about price, marginal costs and demand elasticity become known, market power could have been measured directly, and the entire practice of delineating the relevant market could have been avoided. Hence economists would not necessarily bother with the latter exercise if a more viable economic alternative could be found. However, within the confines of both U.S. and EU legal systems, market definition perpetuates as an ever-valid exercise.<sup>5</sup>

The definition of the relevant market has undergone extensive transformations prior to taking the form it is in today. Initially grounded in the economic concept of cross-price elasticity of demand, an informal assessment of product substitution and interchangeability patterns generally accounted for the early days of market definition. In the absence of a coherent methodology on which to base the assessment, the relevant market consisted in most cases of the group of closest substitutes, or at least those which were perceived as such in the eyes of the antitrust authority handling the case. During this first period, economic contributions<sup>6</sup> (most notably Bain's recognition of the need to limit the scope of the chain of substitution and to narrow down the market to include only significant substitutes) were still random, and did not amount to a complete set of economic criteria that could serve the delineation of the relevant market for legal purposes. The relevant market thus typically encompassed products featuring high-cross price elasticity between them, whilst low cross-price elasticity with others. However, how close substitution should be in order to group together market participants, remained a matter of debate.

Several important court decisions in the second-half of the twentieth century have shed some light on the way market definition ought to be approached, and have provided guiding principles for its decision-making. Most notably, the infamous 1962 U.S. Supreme Court decision in the case of *Brown*

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4 For a complete discussion of the economic definition and the Lerner Index, see Chapter 2.

5 L. Coppi and M. Walker, Substantial Convergence or Parallel Paths? Similarities and Differences in the Economic Analysis of Horizontal Mergers in U.S. and EU Competition Law, 49 Antitrust Bulletin 101, 105 (2004) (maintaining that "in Europe, market definition tends to be a necessary prerequisite for the analysis"); Antitrust Modernization Commission, Report and Recommendations (April 2, 2007). Available at: [http://www.amc.gov/report\\_recommendation/amc\\_final\\_report.pdf](http://www.amc.gov/report_recommendation/amc_final_report.pdf). See also D.L. Rubinfeld, Testimony before the Antitrust Modernization Commission, Economic Roundtable (January 19, 2006).

6 For a general overview see G.J. Werden, The History of Antitrust Market Delineation, 76 Marquette Law Review 123 (1992). A detailed discussion is found in Chapter 2.

*Shoe*<sup>7</sup> established seven ‘practical indicia’ which could be used to confirm market boundaries. These included industry or public recognition of the market as a separate economic entity, the product’s peculiar characteristics and uses, unique production facilities, distinct customers, distinct prices, sensitivity to price changes, and specialised vendors.

More than a decade later, although along similar lines, the landmark European Court of Justice’s decision in the case of *United Brands*<sup>8</sup> reflected analogous reasoning, upholding product characteristics and intended use as the key provisions for market definition inquiries. However, several regulatory changes on both sides of the Atlantic have inspired an alteration of this climate, gradually reformulating the market delineation exercise in more economic terms.

In 1982 and 1984 the U.S. Department of Justice released its Horizontal Merger Guidelines,<sup>9</sup> which tailored a complete economic-based framework for the analysis of market definition in merger investigations for the first time. The Guidelines introduced a novel perception of an antitrust market composed of product and area dimensions, the extent of which would generally be dictated by the merit of demand substitution. It further presented the SSNIP test to govern the procedure of distinguishing products as falling within or outside of the relevant market:<sup>10</sup>

“In general, the Department will include in the product market a group of products such that a hypothetical firm that was the only present and future seller of those products (a “monopolist”) could profitably impose a “small but significant and nontransitory” increase in price. That is, assuming that buyers could respond to an increase in price for a tentatively identified product group only by shifting to other products, what would happen? If readily available alternatives were, in the aggregate, sufficiently attractive to enough buyers, an attempt to raise price would not prove profitable, and the tentatively identified product group would prove to be too narrow”.

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7 *Brown Shoe v. United States*, 370 U.S. 294 (1962).

8 *Case 27/76 United Brands v. Commission*, (1978) ECR 207.

9 Although these were not the first Horizontal Merger Guidelines, the earlier 1968 Guidelines were not thought to offer any meaningful contribution as for how to identify relevant markets in practice.

10 U.S. Department of Justice Merger Guidelines, 4 Trade Reg. Rep. (CCH) 13, 103 (1984), at §2.11. The definition of the 1982 Guidelines was in the same spirit, stating, “a market consists of a group of products and an associated geographic area such that (in the absence of new entry) a hypothetical, unregulated firm that made all the sales of those products in that area could increase its profits through a small but significant and non-transitory increase in price (above prevailing or likely future levels)”. See U.S. DOJ Merger Guidelines, 4 Trade Reg. Rep. (CCH) 13, 102 (1982), at footnote 6.

In applying a quantitative solution to a legal problem, the Guidelines' approach to the problem of market definition was considered innovative. The so-called *hypothetical monopolist* test pioneered by the Guidelines enabled an objective identification of the source of significant market power within an industry, without resorting to the qualitative indicators that prevailed thus far. Most notably, the SSNIP test approach has remained unaltered in the twenty five years of antitrust law enforcement following the Guidelines promulgation, and further spurred other jurisdictions worldwide to adopt an equivalent methodology.<sup>11</sup>

The European Commission officially adopted the SSNIP in its 1997 Notice on the definition of the relevant market. However already in 1992 in the case of *Nestlé/Perrier*,<sup>12</sup> preceding the promulgation Notice by several years, the Commission effectively recognised the key question pertinent to the market definition exercise, that is whether “an appreciable, non-transitory increase in the price of source waters, would lead to a significant shift of demand from source waters to soft drinks”,<sup>13</sup> and whether “French suppliers are able to impose appreciable non-transitory price increases without suffering any external competitive constraint”.<sup>14</sup>

In a similar manner, the 1997 Notice itself formally sets forth the exact means by which the relevant market should be identified. It posits the hypothetical monopolist test at the forefront of its analysis of demand substitution,<sup>15</sup> which, from an economic point of view, constitutes the “most immediate and effective disciplinary force on the suppliers of a given product”.<sup>16</sup>

The Notice further acknowledges the potential contribution of quantitative tools, and considers it relevant evidence in assessing the degree of substitution between products and areas. It therefore enlists three categories of tests to be employed regularly in market identification exercises, namely:<sup>17</sup>

- (1) An econometric estimation of demand elasticities;
- (2) Analysis of prices and price trends;
- (3) Observed trade flow and shipment patterns.

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11 See, for example, United Kingdom Office of Fair Trading, Market Definition, Competition Law Guideline (December 2004). For a comprehensive list of countries which adopted the hypothetical monopolist test see S. Bishop and M. Walker, *The Economics of EC Competition Law: Concepts, Application and Measurement*, Sweet & Maxwell (2<sup>nd</sup> ed., 2002), at 88.

12 Case IV/M.190 Nestlé/Perrier, (1992) OJ L 356/1.

13 Id., at para. 13.

14 Id., at para. 29.

15 Commission Notice on the Definition of the Relevant Market for the Purposes of Community Competition Law, OJ C 372/5 (1997) (hereinafter: “1997 Notice”), at para. 17.

16 Id., at para. 13.

17 Id., at para. 39, 49.

The 1997 Notice reflects thereto growing consensus concerning the importance of economic inputs in competition law in general, and the need for more empirically-fashioned market definitions in particular. As quantitative analysis becomes increasingly accessible – as a result of a combination of computer improvements, data availability and advanced economic theories of competition – it contains the power to revolutionise the quality of antitrust enforcement, its predictability, and its deference among antitrust practitioners.

This book has endeavoured to scrutinise whether European competition law is truly becoming more economics-oriented, and whether the challenges enveloped in the 1997 Commission's Notice are being met. To this end, this book has portrayed the evolution of the Commission's decisional practice, and investigated the potential contribution of economic insights and measurement techniques to the formation of market definition. The book opened with an introductory chapter, addressing the expansion of economic analysis in EU competition law as well as in other jurisdictions, most notably the U.S. counterpart. As reflected in public statements released by EU officials, conformity of competition law with economic principles occupies nowadays a significant part of the top-European agenda. The implementation of several reforms in various fields of competition policy, together with conceptual and institutional changes can be partially attributed to this tendency. An additional important step along this road was the nomination of the first Chief Competition Economist, and the creation of a Chief Economist Team in 2003, aimed at strengthening the Commission's economic capabilities and formalising the role of economics in EC competition policy. The need for sound economic reasoning is also manifested in recent rulings of the European Court of Justice, highlighting the Commission's obligation to substantiate its legal analysis and to appropriately prove its economic theories.

Chapters 2 and 3 laid down the legal and economic grounds underlining the market definition question. Chapter 2 centred on the economic notions of competition on the one hand, and market power on the other. European competition rules are predominantly occupied with the maintenance of 'effective competition', relating to the freedom of the rivalry process, and implying the absence of restraints on firm's conduct by market rivals. The elimination of possible inefficiencies resulting from the exercise of market power is therefore considered of utmost importance in competition policy and enforcement.

In light of this goal, this chapter introduced the economic foundations pertinent to competition law analysis. It explained fundamental economic concepts such as perfect competition, monopoly and oligopoly, and highlighted the social

cost associated with deviations from the competitive benchmark, and the possession of market power. This chapter then addressed the question how market power could be identified, central to nearly all competition law proceedings. Moreover, since market power is a matter of degree, the problem of measuring and quantifying it immediately presents itself.

Whilst economic theory depicts market power as the persistent setting of price in excess of the level that would prevail under effective competition, competition law finds this definition inapplicable, as merely the former price level is observable. In addition, almost any real-life firm may potentially subscribe to this definition. Nonetheless, not all degrees of market power should warrant similar antitrust concerns. To establish what may be considered a sufficiently significant and durable degree of market power – bringing competition enforcement on board – an indirect analytical approach has emerged in competition analysis. According to the latter, market power is not directly estimated, but is rather deduced from the accumulation of several structural indicators, consisting of an estimation of the firm's market share, the level of industry concentration, and the existence of entry barriers into the market. The ascendancy of structural analysis in European legal discourse – portrayed along this chapter – is thus indicative of the high value placed on market definition, as the benchmark against which all other factors are assessed. As the foregoing discussion revealed, however, market definition is not an end in itself, but rather a tool in identifying and grouping together the main competitive forces relevant to the case at hand.

Given the central function of market definition, Chapter 3 proffered a detailed representation of what features a relevant antitrust market. In particular, two main questions were being investigated. First, what qualifies a market for competition law purposes, and second, how exactly should markets be delineated.

This chapter closely examined the perception of a market in economic and legal approaches. The notion of an 'antitrust market' was contrasted with several other prevalent categorical market definitions, particularly those referring to industries, strategic and economic markets. Whilst the above-mentioned definitions may sometimes overlap, it became clear that the concept of an antitrust market is unique, encompassing the set of strongest economic substitutes, or in other words, the group of products and areas that could potentially exert their market power to raise prices profitably.

With this definition in mind, the chapter moved to assess market definition in the EU. It laid down the 1997 Notice's theoretical framework for defining relevant markets, and critically analysed its prescriptions for the ways in which market boundaries ought to be appraised in practice. Finally, this chapter scrutinised two potential difficulties associated with the application of the SSNIP



test: its dubious endurance in monopolisation cases (a problem better known as the ‘cellophane fallacy’), and its implementation to technologically-driven markets.

Chapter 4 brought together a wide array of quantitative tests applied in competition analysis to this day. It addressed techniques that are routinely utilised by European competition authorities, together with tests which are less frequently applied, but may nonetheless offer valuable contributions to the competitive assessment. In particular, it accommodated techniques such as price correlation analysis, shock analysis, or the analysis of trade flows – often invoked by the Commission to aid its market definitions – together with various more sophisticated measures. This need not imply that some of the more intuitive techniques utilised in the European discourse do not convey meaningful information, but it can be fairly assumed that the more advanced the economic tools are that utilised, the more robust the resulting market definition is.

The discussion portrayed a complete account of each particular technique: the circumstances in which it could be employed, the data required for its optimal performance, potential pitfalls inherent to the analysis, and ways to overcome the latter. Moreover, the use of each technique in actual legal practice was discussed by using real-life examples of European and foreign case law. As turned out to be the case, in many antitrust proceedings it is the combination of techniques which can eventually shed light on the market definition puzzle. The aim was therefore to construct a full picture of all the economic tools offered nowadays to antitrust practitioners and competition authorities, and to lay the grounds for more objectivity and credibility in future market definition exercises.

Finally, Chapter 5 depicted a selection of landmark European cases, to allow a complete account of the Commission’s actual commitment to economic analysis. The cases examined the entire market definition framework as employed by the Commission, including the application of the SSNIP test, the role of demand and supply-side substitution considerations, the treatment of the product and geographic dimensions of the market, and the extent to which quantitative tools were utilised to enhance the legal dialogue. Commencing with the early ‘*banana case*’, and concluding with the latest *Blackstone/Acetex* merger, this chapter offered a tentative roadmap to nearly thirty years of European practice, and the important milestones it encountered on its way to becoming ‘more economic-based’.

At the end of this journey, it may be useful to recall the questions standing at the heart of the study:

1. Is the more economic approach taken by the European Commission in conformity with theoretical economic insights on market definition?
2. Do decisions in real-life cases under European competition law utilise all relevant empirical measures?

The following paragraphs seek to provide some answers.

## **6.2 Is the European Commission's Practice Sufficiently Guided by Sound Economic Theory?**

The 1997 Commission's Notice on market definition carried the potential to bring European competition law practice into the economic realm. That promise, however, has not fully materialised. A typical market definition exercise, according to the Notice, rests largely upon an evaluation of demand-side substitution, in line with the framework put forward by the SSNIP test and aided by the quantitative measures suggested thereto. Supply-side considerations may also play a part, but usually to a much lesser extent, whereas potential competition is excluded from the market definition stage altogether. It would appear that this practice suffers from several inconsistencies, which may undermine the quality of the Commission's analyses. To begin with, whilst the Notice acknowledges the constraining effect of supply substitution to be essentially equivalent to that of demand substitution,<sup>18</sup> it does not apply the SSNIP test to the former, though providing no apparent economic reasoning for this omission. In many real-life Commission's cases, as well as throughout the Notice itself, the question whether alternative suppliers could profitably and permanently raise their prices by 5 to 10 percent is not even posed. For the most part, the Commission settles for reviewing differences in production, technology or distribution systems, which arguably render supply responses commercially unfeasible.<sup>19</sup>

Furthermore, the analysis of supply responses surpassing the short term will not be carried out according to the Notice at the stage of market definition. The Commission will not consider any potential responses of competing suppliers if those entail the adjustment of existing assets, additional investments, strategic decisions

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18 *Id.*, at para. 20.

19 For example see Case IV/M.430 Procter & Gamble/VP Schickedanz (II), (1994) OJ L 354/32, at para. 15.

or time delays. Such considerations will only be taken into account at a subsequent stage, when assessing entry conditions. Whilst it may be easier to appraise the factors and circumstances affecting entry into the market once the position of the companies involved in the relevant market has already been ascertained, leaving out potential competitors might lead to overly narrow market definitions, which exclude significant competitive constraints. In some markets, especially dynamic ones, potential rivals pose a credible source of effective competition, due to their likely ability to enter the industry at once. Hence excluding them from the relevant market runs the risk that “the starting point was not correctly defined”.<sup>20</sup>

Equally troubling is the Notice’s submission of the provisions to be employed. Alongside the introduction of new quantitative measurement techniques, the Notice preserves traditional legal provisions. The combination of these two inherently different *modus operandi*, however, comes at a high price, since it tends to obscure the analysis, and reduce the predictability of the Commission’s market definitions, undermining legal certainty altogether.

In particular, despite the Notice’s seemingly well-structured and economic-based layout, functional interchangeability indicia are entangled in the Notice’s text,<sup>21</sup> indicating that in the Commission’s view the latter are clearly relevant to the practice of delineating market boundaries. In fact, whilst the Commission regards such considerations as a starting point for its own analyses, aiming to limit the field of investigation of possible substitutes, this first-step screening process is likely to appear detrimental, as it may already exclude relevant competitive forces at a preliminary stage.

Such an approach is prone to errors, as it involves subjective judgments to a large extent. Consider, for example, the landmark European Court of Justice’s ‘*banana case*’,<sup>22</sup> where the ECJ distinguished bananas on the basis of their allegedly unique features, paying no proper account of the feasibility of substitution of bananas and other fresh fruit. Although from an economic point of view product characteristics and intended use are not directly linked to the identification of market power – the ultimate goal of the market definition exercise – they remain therefore highly regarded, indicating that the Notice’s conceptual improvement over the orthodox legal ‘straight-jacket’ to market definition is, at best, ambiguous.<sup>23</sup>

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20 Van den Bergh and Camesasca (2006), *op. cit.*, at 129.

21 1997 Notice, at para. 7, 8, 36.

22 Case 27/76 United Brands Company and United Brands Continentaal BV v. Commission, (1978) ECR 207. A detailed discussion of the case is found in Chapter 5.

23 Coppi and Walker (2004), *op. cit.*, at 104; P.D. Camesasca and R.J. Van den Bergh, Achilles Uncovered: Revisiting the European Commission’s 1997 Market Definition, 47 Antitrust Bulletin 143 (2002), at 158-159. Indeed, prior to the publication of the 1997 Notice on market definition, common

An illustration for the pitfalls associated with placing excessive weight on product characteristics may be found in the recent *AOL/Time Warner* merger.<sup>24</sup> The merger concerned the market for on-line downloadable music, which, if viewed in isolation, allowed the parties 30-40% of music publishing rights. These figures would have dropped significantly under a broader definition, encompassing both on-line music and music distributed on physical carriers. Under the SSNIP methodology, the issue of whether music retrieved throughout the on-line distribution channel is distinct from the purchase of physically-distributed content has to be assessed on the basis of substitution between the two types of products. The relevant issue is whether consumers would readily switch between these modes of music distribution had prices been permanently raised. In that vein, the relevant antitrust market may be broadened to include for example CDs, if evidence can be collected to testify on the nature of consumers' preferences. Put differently, the question whether buying music on the Internet is perceived by consumers as simply one alternative channel for buying music content has to be answered empirically.

In contrast, a 'product characteristics' approach would concern itself with technological or organisational characteristics of the product, e.g. features, manufacturing, distributional structure, mode of sale, etc, which undoubtedly differed for on-line music compared with physical CDs. The outcome reached if one follows this path might, therefore, be very different from a SSNIP-based outcome. Whereas the traditional legal approach would likely qualify on-line music offerings as a single market, undertaking the SSNIP test would possibly point to the need to enlarge these narrow boundaries. Regretfully, the Commission in this case opted for the first option.

Finally, the selection of economic techniques, with which the Notice aspires to promote a more accurate measurement of substitution, is unsatisfactory. Although the SSNIP test was adopted as the central conceptual framework governing the exercise of market definitions, the account of economic methods aimed at quantifying its impact is incomplete. The range of techniques is limited and the techniques themselves are rather rudimentary compared with the degree of sophistication clearly evident in contemporary economic practice. As discussed in detail throughout this book, some of the techniques publicised by

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practice was to rely mostly on qualitative considerations when defining relevant markets. In this context, V. Korah, *An Introductory Guide to EC Competition Law and Practice*, Hart (8<sup>th</sup> ed., 2004), mentions at 99: "... the older case law is also relevant. In decision since the adoption of the notice, the Commission has tended to use the older more concrete test".

24 Case COMP/M.1845 AOL/Time Warner, (2001) OJ L 268/28.

the Commission, though exhibiting intuitive appeal suffer from serious shortcomings and may produce non-sensible market definitions.

For example, the analysis of prices and price movements has often been criticised as inadequate for the purpose of market definition. Correlation analysis presents several inherent pitfalls that undermine its effectiveness and reliability, most notably regarding its inability to establish a causal relationship between observed price movements of two products. As a result, even the fact that two products appear highly correlated does not suffice to prove that they constitute one relevant market, and does not exclude the possibility of one of the products being a relevant market by itself. Additional complications are associated with the need to rule out spurious correlations (e.g. common costs, common influences, seasonality), correlations resulting from supply responses of competing firms, or the absence of visible correlation due to a delay in response for some products or areas. Price based analysis – a highly popular tenant of the Commission's practice – should thus be treated with caution in light of the limitations presented.

A similar warning should also be voiced towards the employment of trade flow and shipment patterns. In fact no volume of physical movement can truly ensure that two areas constrain one another against a price increase, and both the absence and presence of significant trade flow between regions are insufficient to establish whether regions are or are not part of the same relevant geographic market. As with price correlation analysis, these tests may suggest closeness between products or regions, but remain indefinite in determining the exact scope of the relevant market, and do not answer the question asked by the SSNIP test directly.

As for the third category of empirical tools identified by the Notice – an econometric estimation of demand elasticities – this technique indeed is a trustworthy measure for defining markets and assessing the degree of market power. As discussed earlier in detail, an estimated demand elasticity correctly accounts for the two economic factors that determine the profitability of a unilateral price increase by the hypothetical monopolist: the change in revenue and the change in costs, whereby a price increase is profitable if the second effect outweighs the first. Therefore, a measure of the own-price elasticity reveals the exact extent to which consumers would shift away from a product upon its price rise, and allows a direct implementation of the SSNIP framework in practice. So far so good, but as discussed below, an analysis of demand elasticities does not feature Commission decisions every so often. As the estimation procedure is particularly data intensive and requires a considerable degree of economic sophistication, it does not routinely occupy investigations under European competition law.

Moreover, additional advanced economic insights, such as critical loss analysis, or merger simulations, ultimately did not find their way into the Notice. Whilst Chapter 4 of this book discussed eleven of the most prominent techniques prevalent today in antitrust analysis, only three of them are included in the wording of the Notice. In this respect, although the Notice may have ostensibly signalled a step forwards away from conventional legal methods, in reality suspicion towards the use of economic analysis remains entrenched.

It may be concluded therefore that the regulatory provisions utilised by the European Commission are to some extent at odds with the economic theory underpinning the definition of the relevant market. As maintained by one Commentator.<sup>25</sup>

“While the Notice may indeed increase transparency it does not go so far as to establish a methodology by which cases may be resolved consistently throughout the E.C. Elsewhere the E.C. Commission has argued that “[i]n practice, the application of economic theory must take place in the context of the existing legal texts and jurisprudence ... economic theories are necessarily based on simplifying assumptions often obtained in the context of stylised theoretical models that cannot take into account all the complexities of real life cases”. The issue of market definition, which is one of economics, cannot be adequately resolved by the application of a legal analysis, however rigorous and well-developed”.

Nowadays, when the Commission’s 1997 Notice reaches its tenth anniversary, the Commission may be summoned to promulgate a new market-definition Notice, one which would guide the way for a truly ‘more economic approach’ in the European Commission’s decision-making process.

### **6.3 Do Decisions in Real-Life Cases under European Competition Law Utilise all Relevant Empirical Measures?**

In spite of the observed tendency towards more economics in European competition law, integrating economic principles into the existing legal framework is not a simple task. Many ‘traditional’ lawyers and judges appear reluctant to accept economic reasoning and the scantiness of econometric and statistical education renders the delineation of the relevant market an exercise fraught with tension. Whilst the analysis of market definition is now formally equivalent in

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25 M. Furse, Market Definition: The Draft Commission Notice, 18 European Competition Law Review 378, 381 (1997).

the EU and U.S. legal systems – generally reflecting greater compliance with economic reasoning – the manner in which markets are defined tend to differ.

In the U.S., the exercise of market definition is governed by the hypothetical monopolist test and is to a large extent an element of economic analysis. As articulated by one commentator:<sup>26</sup>

“To U.S. antitrust lawyers, judges, and juries, market definition is a process dominated by economists who shape lawyers’ arguments and engage in testimonial battles in court. The definition of relevant markets is often critical to outcomes, and a commensurately high amount is often expended on developing economic studies bearing on the issue. Because market definition is typically seen, at least today, as an economic issue, it is legitimate to consider whether a non-economist lawyer has, or should have, anything of consequence to say about the topic”.

In fact, whilst the 1997 Notice effectively established the SSNIP test to govern the exercise of market definition, in practice this methodology is not routinely followed, being viewed merely as one of many approaches to market definition. The European Court of Justice in *Airtours* has rejected the applicant’s dispute that the market definition has to be based on the SSNIP,<sup>27</sup> and concurred with the Commission’s analysis essentially comprising of prices and characteristics comparisons.<sup>28</sup> The Commission, for its own part, does not follow the SSNIP test as routinely as may be expected. In many cases, the question of the ability of an undertaking or a group of undertakings to profitably raise prices above the competitive level clearly does not guide the assessment. In the recent transatlantic *Cruise Ships*<sup>29</sup> merger investigation, the essence of the Commission’s approach with regards the extent to which market definition should be conducted in accordance with the SSNIP, was conveyed in the following statement, delivered in a footnote in the decision:<sup>30</sup>

“The Commission has, however, been unable to gather data that would enable it to perform any quantitative tests on the boundaries of the relevant market. When such data is available empirical tests such as the SSNIP test can be done to try to establish how customers would react to a change in relative prices of the products in question ...”.

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26 T.E. Kauper, *The Problem of Market Definition under EC Competition Law*, 20 *Fordham International Law Journal* 1682 (1997).

27 Case T-342/99 *Airtours v. Commission*, (2002) ECR II-2585, at para. 31.

28 *Id.*, at para. 19-48.

29 Case COMP/M.2706 *Carnival Corporation/P&O Princess*, (2003) OJ L 248/1.

30 *Id.*, at footnote 10.

Regardless of the data issues raised in the decision,<sup>31</sup> the Commission's terminology is troubling. It refers to the SSNIP test as one possible empirical test, rather than the complete analytical framework laid-down by the 1997 Notice to govern the market definition exercise.

In the context of geographic market definition, the test is even more loosely applied.<sup>32</sup> Although the Notice considers the SSNIP methodology for both product and geographic relevant markets, in practice the test's implementation (explicitly or implicitly) is much more apparent and better structured in product market definition exercises. Geographic reference markets are often decided on the basis of homogeneity of the competitive conditions prevailing within a certain area, in a manner resembling the 'product characteristics' approach to product markets,<sup>33</sup> As a result, many Commission decisions lack analytical rigour, in that they do not revolve around the undertaking's ability to profitably raise prices above the competitive level, and do not seriously endeavour to quantify that effect. Instead, it is often the case that the market definition stage proffers an informal and sometimes incoherent representation of the functional interchangeability indicia mentioned above.<sup>34</sup>

Such an approach allows for far-reaching judicial discretion, whilst posing a real risk of unduly narrow market definitions, as well as compromising the reliability of competition analysis. As was recently stated in relation to the forthcoming revision of Article 82.<sup>35</sup>

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31 See the discussion in Chapter 5. However, the analyses undertaken by parallel jurisdictions cast some doubts over this claim.

32 Copenhagen Economics, *The Internal Market and the Relevant Geographic Market* (3 Feb. 2003); Coppi and Walker (2004), *op.cit.*, at 104, 109-110.

33 See for example case 27/76 *United Brands Company and United Brands Continentaal BV v. Commission*, (1978) ECR 207; Case IV/M.430 *Procter & Gamble/VP Schickedanz (II)*, (1994) OJ L 354/32; Case COMP/M.2706 *Carnival Corporation/P&O Princess*, (2003) OJ L 248/1. Note, however, that the recent decision in Case COMP/M.3625 *Blackstone/Acetex*, (2005) OJ L 312/60 (notified under document number C (2005) 2672), makes clear that the SSNIP test should be equally applied to the relevant geographic market. For the complete discussion see Chapter 5.

34 C. Veljanovski, *EC Merger Policy after GE/Honeywell and Airtours*, 49 *Antitrust Bulletin* 153 (2004), at 167.

35 International Chamber of Commerce, *The World Business Organization, Commission on Competition*, ICC Comments on the European Commission Discussion Paper on the Application of Article 82 of the Treaty to Exclusionary Abuses (April 7, 2006), at 2. Similar concerns may apply to mergers. See also Veljanovski (2004), *op. cit.*, maintaining at 168: "The Commission is frequently criticized for adopting unduly narrow product and geographic market definitions in order to find a merger incompatible with Community law, or alternatively working back from its conclusions to define a relevant product market".



“An over-subjective definition of the market according to the criticized abuse should also be avoided as much as possible. One should rely on objective criteria. In this respect, it is regrettable that the Commission plans on too often setting aside the SSNIP test, which offers companies a certain predictability and assists competition authorities in evaluating the market ...

Moreover, the application of a test premised solely on product characteristics may well result in an overly narrow market definition. This could lead to erroneous findings of dominance in the overly narrow market”.

Whilst the use of empirical methods is considered to be one of the most important improvements in competition analysis featuring both EU and U.S. antitrust regimes, the European Commission does not apply empirical analysis as vigorously as U.S. antitrust authorities.<sup>36</sup> At the outset, the indiscriminate inspection of EU cases undertaken in Chapter 5, confirmed that probative evidence remains paramount in the Commission’s practice to date. For example, the 1992 *Nestlé/Perrier*<sup>37</sup> decision features *inter alia* an account of consumers’ motivations in purchasing bottled source water, their perception of the product, the product’s composition, its taste and intended use, together with the conditions of production and distribution and the views of retailers. Likewise, in the 1994 *Procter & Gamble/Schickedanz*<sup>38</sup> case, a wide range of qualitative considerations were enlisted to establish separate markets for tampons and towels. Among them, product characteristics and featured variations (shape, style, packaging, performance), including the different materials that are used to produce towels and tampons. Reference was also made to the different mode of utilisation of these products, the consumption preferences and patterns of usage, non-price considerations such as comfort, security and discretion, as well as non-performance considerations including potential aversion of some women to the use in one of these methods.

Furthermore, the *Cruise Ships*<sup>39</sup> merger, succeeding the publication of the Notice, does not feature any departure from this practice. In differentiating oceanic cruises from holiday of another form, the Commission largely relied on characteristics of cruising and consumers’ perceptions, the existence of costumer groups separated demographically, branding, marketing and distribution methods, customers booking patterns, and views of travel agents and competitors.

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36 Coppi and Walker (2004), op. cit., at 108; Veljanovski (2004), op. cit., at 164.

37 Case IV/M.190 Nestlé/Perrier, (1992) OJ L 356/1.

38 Case IV/M.430 Procter & Gamble/VP Schickedanz (II), (1994) OJ L 354/32.

39 Case COMP/M.2706 Carnival Corporation/P&O Princess, (2003) L 248/1.

As regarding the use of quantitative measures, two tendencies may be depicted in the Commission's practice: first, the type of quantitative methods selected, and second their induction. To begin with, different quantitative tools have seemingly gathered popularity in the EU, in contrast to the U.S..<sup>40</sup> Whereas the evaluation of price levels and price trends is pronounced in European cases,<sup>41</sup> econometric estimation of demand elasticities features in fewer Commission decisions,<sup>42</sup> whilst critical loss analysis is utterly absent. Generally speaking, U.S. regulators incline more towards advanced measures, reflecting the greater consensus among economists and legal practitioners regarding the importance of quantifying market definition. As noted by one commentator:<sup>43</sup>

“Antitrust litigation has come to rely to a greater and greater extent on empirical methods. While the range of applications is quite broad, it is not unusual to observe multiple regression and other statistical methods being utilized in defining relevant markets ... With respect to market definition, it is essential for the fact finder to assess buyer substitution patterns as effectively as possible. Historically, most of the relevant substitution evidence has come from indirect indicators related to seller practices – marketing studies and the like. Increasingly, however, econometric methods have been used to supplement these indicators, often with determinative outcomes.”

In comparison to the U.S. enthusiasm towards empirical economic advancements,<sup>44</sup> the EU approach appears somewhat agnostic to the latter. It would appear that the Commission commonly resorts to more intuitive instruments, which do not necessitate a special economic expertise. Those, however, may come at the expense of the analytical rigour manifested in the 1997 Notice's SSNIP methodology.<sup>45</sup>

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40 Coppi and Walker (2004), *op. cit.*, at 108-109.

41 Notable examples are Case IV/M.190 Nestlé/Perrier, (1992) OJ L 356/1; Case IV/M.430 Procter & Gamble/VP Schickedanz (II), (1994) OJ L 354/32; Case IV/M. 315 Mannesmann/Vallourec/Ilva, (1994) OJ L 102/15; Case IV/M. 619 Gencor/Lonrho, (1997) OJ L 11/30.

42 One important exception is, however, Case IV/M.623 Kimberly-Clark/Scott, (1996) OJ L 183/1, discussed at length in Chapter 5.

43 D.L. Rubinfeld, *Market Definition with Differentiated Products: The Post/Nabisco Cereal Merger*, 68 *Antitrust Law Journal* 163 (2000).

44 See for example R.J. Epstein and D. L. Rubinfeld, *Merger Simulation with Brand-Level Margin Data: Extending PCAIDS with Nests*, Competition Policy Center working paper No. CPC03-40 (2003), maintaining at 2: “A virtually unknown area a few years ago, the FTC has recently termed [merger] simulation among the past decade's “remarkable developments in the quantitative analysis of horizontal mergers”” (reference omitted).

45 That is not to say that the Commission avoids sophisticated economic tools altogether. In Case Comp/M.1672 Volvo/Scania, (2001) OJ L 143/74, the Commission authorised a merger simulation exercise, to economically assess the consequences of the transaction. The simulation was imple-

One often-heard justification for this state of affairs relates to availability of suitable data.<sup>46</sup> However, whilst data may vary in terms of magnitude and type, this need not be the inevitable outcome. Data scarcity may undeniably cause a bias in the choice of methodology, and might undermine the analytical rigour of the investigation. Nonetheless in many cases, data is sufficient to afford at least a partial economic analysis, which should be seen as preferable over basing market definition on purely subjective grounds.<sup>47</sup> Incomplete data does not necessarily outmode empirical analysis, as it may be used to reject parties' conjectures or to test provisional market definitions.<sup>48</sup> Although EC competition law often has to rely on less available data, compared to that in the U.S.,<sup>49</sup> contemporary quantitative tools are adequately broad in range to accommodate different types of cases and circumstances, according to the information available at hand.<sup>50</sup>

A more serious apprehension concerns an inherent distrust towards the capability of quantitative methods to constructively enrich the legal dialogue,<sup>51</sup>

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mented by M. Ivaldi and F. Verboven, *Quantifying the Effects from Horizontal Mergers in European Competition Policy* (2002), though not explicitly referred to by the Commission in its decision. Furthermore, the Commission seems to recognise itself the need to shift away from traditional market definition. As recently stated by Lars Kjoelbye, an official at the DG Competition, the Commission's analysis of cases dating back over four or five years was "not likely to be entirely satisfactory". Quoted in L. Hutchinson, *EC Making Increasing Use of Merger Simulation Techniques in Antitrust Probes; Market Definition taking Back Seat – Analysis*, *Mergermarket* (January 31, 2005). Available at: [http://www.nera.com/image/mergermarket%20article\\_Feb\\_2005.pdf](http://www.nera.com/image/mergermarket%20article_Feb_2005.pdf).

46 Bishop and Walker, *op. cit.*, at 6-7, 322-323.

47 On the diversity of empirical methods in antitrust litigations see generally D.L. Rubinfeld, *Symposium on Law and Economics: Econometrics in the Courtroom*, 85 *Columbia Law Review* 1048 (1985); A.M. Rosenfield, *The Use of Economic Analysis in Antitrust Litigation and Counseling*, 1986 *Columbia Business Law Review* 49 (1986); J. B. Baker and T.F. Bresnahan, *Empirical methods of Identifying and Measuring Market Power*, 61 *Antitrust Law Journal* 3 (1992); J.B Baker and D.L. Rubinfeld, *Empirical Methods in Antitrust Litigation: Review and Critique*, 1 *American Law and Economics Review* 386 (1999); D. Scheffman and M. Coleman, *FTC Perspectives on the Use of Econometric Analyses in Antitrust Cases*, Bureau of Economics, Federal Trade Commission. Available at: <http://www.ftc.gov/be/ftcperspectivesoneconometrics.pdf>; D. Scheffman, *Sources of Information and Evidence in Merger Investigations: An FTC Economist's View*, Remarks to a session on "The Use of Economics in EC Competition Law, Brussels (January 2003).

48 For example, an evidence of a strong negative correlation between prices of two products may serve to refute parties' contention regarding the breadth of the relevant market, and imply that the candidate market may have to be narrowed.

49 Bishop and Walker (2002), *op. cit.*, at 7; Coppi and Walker (2004), *op. cit.*, at 108. To a certain extent this can explain the strong EU adherence to price tests, for which data is more readily available, over more advanced empirical tools.

50 An interesting illustration of the differing attitudes to empirical analysis is manifested in the Cruise Ships merger investigation, which was simultaneously carried out in the EU, UK, and U.S. Whilst the FTC exhibited a highly quantitative approach, attempting to establish economically the position of cruises within the overall vacation market, the discussions portrayed by the UK Competition Commission and the European Commission were largely qualitative. For the elaborated discussion see Chapter 5.

51 Bishop and Walker (2002), *op. cit.*, at 7, 323.

Indeed, quantitative analysis can do little to abet an antitrust investigation when it rests on inappropriate data, when the chosen economic model does not fit the realities of the industry under review or the facts of the case, when not all relevant factors are accounted for, or when results are manipulated to corroborate a certain outcome. In particular, the robustness of any empirical analysis will be judged upon the reliability of the economic theory it employs, by the plausibility of the incorporated assumptions, and by its ability to substantiate its conclusions.<sup>52</sup> Therefore, to make meaningful predictions empirical economic analysis – just like any other expert testimony – should subscribe to the general rules of admissibility,<sup>53</sup> in order to be able to ultimately persuade non-economists – lawyers and judges – as to the validity of its results. However, when quantitative techniques are applied correctly, they can significantly support qualitative analysis and assist in making informed decisions, producing a greater degree of accuracy and certainty in antitrust policy and enforcement. Whilst it is well acknowledged that no single technique can ultimately resolve the market definition puzzle, empirical analysis may constitute a powerful piece of evidence in a case, complementary to qualitative considerations. European practice so it would seem still falls short of fully appreciating the added value of the economic approach, and hence, quantitative tools are still invoked in moderation.

A second pattern observable in the European legal process concerns the question which side commences the empirical evidence. As it appears, quantitative techniques are often commissioned by the litigating parties, rather than the Commission itself.<sup>54</sup> Parties, as a matter of fact, have numerous good reasons to seek the aid of economic consultants, most notably in attempting to fortify a legal argument, or rebut a claim advanced by another party or competitor. As one commentator aptly noted: “In antitrust litigation, the factual complexity and economic nature of the issues involved require the presentation of economic expert testimony in all but a few cases”.<sup>55</sup> It is not surprising therefore that most of the big cases are supported by economic experts.<sup>56</sup>

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52 NERA Economic Consulting, *The Role of Quantitative Analysis in Competition Assessments*, Federal Court/Law Council of Australia, seminar on competition law (March 2005), at 3-10. See also J.E. Lopatka and W.H. Page, *Economic Authority and the Limits of Expertise in Antitrust Cases*, 90 *Cornell Law Review* 617 (2005).

53 G.J. Werden, *The Admissibility of Expert Economic Testimony in Antitrust Cases*, U.S. Department of Justice - Antitrust Division, *Antitrust Law* (forthcoming); G.J. Werden, L.M. Froeb and D.T. Scheffman, *A Daubert Discipline for Merger Simulation*, Federal Trade Commission, Bureau of Economics (February 16, 2004); L. Wu, *The Economic Analysis of Mergers After Daubert*, 1 *Economics Committee Newsletter* 16 (2001).

54 For example, quantitative studies were submitted by the parties and by a major competitor in Case IV/M.623 *Kimberly-Clark/Scott*, (1996) OJ L 183/1, but not by the Commission itself.

55 Lopatka and Page (2005), *op. cit.*, at 617.

56 Examples are manifold: Professor Richard Schmalensee acted as Microsoft's Chief Economist in the U.S., NERA and Mercer Consulting Group supported Microsoft along the EU litigation, as well

However, economic analysis constitutes a well-established weapon in the antitrust authorities' arsenal in the U.S.,<sup>57</sup> the European Commission generates empirical evidence on its own initiative more sporadically. Indeed, on several instances the Commission has authorised economic studies for ascertaining its theories. It requested for example an econometric analysis from Professors Ivaldi and Verboven in order to measure the prospect of a price increase charged by heavy truck producers in the *Volvo/Scania*<sup>58</sup> merger. Likewise, it commissioned NERA to analyse winning bids in the case of *General Electric/Instrumentarium*.<sup>59</sup> This practice is, however, occasional, and does not routinely accompany the analysis of cases. It is expected that the recent expansion of the Commission's economic resources – manifested in the establishment of the Chief Economist Team – would bring about an increased prominence of economic reasoning in the Commission's practice. A move in the right direction was made in the *Blackstone/Acetex*<sup>60</sup> merger, where the Commission carried out its own investigation via its Chief Economist Team. Such separate economic analysis is not only economically warranted (in light of the special economic expertise possessed by the members of the Economist Team), but also allows an insightful comparison with the parties' submissions, as well as an opportunity to critically evaluate the latter.

To recap, whilst European competition law has come a long way from its traditional origins and sole reliance on subjective legal criteria, the 'modernisation' of the market definition exercise – in line with the rising global demand for empirical inputs in competition analysis – has not yet been completed. Indeed, the Commission endeavours in its Notice to follow "an open approach to empirical evidence, aimed at making an effective use of all available information which may be relevant in individual cases".<sup>61</sup> Nonetheless, insofar as the application of empirical tools is considered, the gap between theory and practice is still largely evident.

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as MIT Professor Franklin Fisher for IBM, Professor David Teece for Rambus, RBB Economics for General Electric, and so on.

57 E.g. Professor Daniel Rubinfeld, Professor Carl Shapiro and Professor Franklin Fisher, conducted economic analysis to the U.S. government in its celebrated case against Microsoft. Similarly, Professor Jonathan Baker provided the government's econometric evidence in the famous *FTC v. Staples* litigation. As illustrated in the introductory chapter, this naturally stems from the extensive economic resources possessed by U.S. enforcement agencies.

58 Case Comp/M.1672 *Volvo/Scania*, (2001) OJ L 143/74.

59 Case COMP/M.3083 *GE/Instrumentarium*, (2004) OJ L 109/1.

60 Case COMP/M.3625 *Blackstone/Acetex*, (2005) OJ L 312/60 (notified under document number C (2005) 2672).

61 1997 Notice, at para. 25.

## 6.4 An Outlook into the Future of Market Definition

This book presupposed a central role for market definition as a crucial facet of the competitive assessment. Not all, however, would subscribe to the sheer relevance of this exercise, as the ensuing paragraph clarifies:<sup>62</sup>

“Let me begin with a confession: When conducting merger analyses and when handling the premerger process in the United States on behalf of notifying parties, I have not defined a market in more than fifteen years. From my private sector, defense-oriented perspective, the need to conduct a comprehensive, formal, Guidelines-style market definition exercise has not presented itself even once – not in defending several transactions in the courts, not in handling dozens of staff investigations, not in handling hundreds of premerger notifications, not in providing counseling to party and third-party clients in connection with literally thousands of transactions. Worse than unnecessary, any effort formally to define markets would have been unduly costly, time-consuming, and invasive, and it probably would have yielded less reliable outcomes than more streamlined techniques. The only instances in which I have expressed a contention as to “relevant market” have been (a) in private litigation on behalf of plaintiffs and (b) in premerger notifications submitted in foreign jurisdictions that require a statement of market definition in order to perfect the submission. In those instances the contentions have been less analytically satisfying than no definition at all”.

Economists have long disputed the contention that a proper economic analysis of a particular transaction or conduct requires a protracted delineation of the relevant market. The Schumpeterian<sup>63</sup> notion of competitive rivalry, by which competition is perceived as a process of spontaneous coordination and evolution, where market participants are constantly looking to gain competitive advantage, implies that the market cannot easily be divided into various segments. It thus relegates any conclusions associated with structural indicators. Viewed throughout a dynamic prism, the legal prerequisite to delineate the relevant market, and the predictive value assigned to market shares appear redundant, as they may become part of the analytical problem rather than a useful aid.<sup>64</sup>

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62 W. Blumenthal, *Why Bother?: On Market Definition under the Merger Guidelines*, Statement before the FTC/DOJ Merger Enforcement Workshop, Washington DC (February 17, 2004).

63 J.A. Schumpeter, *Capitalism, Socialism and Democracy*, Harper & Row (1942). The dynamic vision of competition was advanced in its most extreme form by the disciples of the Austrian School which originated in the writings of Carl Menger in the second half of the 19th century, and were further developed by a growing number of economists, most notably Hayek, Mises and Kirzner.

64 This is with particular importance to dynamic ‘new economy’ markets, where the contours are continuously shifting and new players emerge at a too rapid pace for antitrust authorities to keep track. For further discussion see Chapter 3.

There are other reasons for market definition to come under attack, as articulated by several distinguished economists. For example, Prof. Ordover, a Former Deputy Assistant Attorney General for Economic Analysis in the U.S. Department of Justice, has noted:<sup>65</sup>

“From the perspective of economic theory, antitrust law’s preoccupation with market definition has always seemed somewhat peculiar. Arguments for and against a merger that turn upon distinctions between broad and narrow market definition are, to an economic pursuit, an inadequate substitute for, and a diversion from sound direct assessment ...”

Likewise, Professor Jonathan Baker, a former Director of the U.S. Federal Trade Commission’s Bureau of Economics, observed:<sup>66</sup>

“Antitrust should not need to spend much effort on market definition ... if the likely harm to competition from a merger can be demonstrated directly, there exists a market where harm will occur, but there is little need to specify the market’s precise boundaries”.

And elsewhere:<sup>67</sup>

“Formal market definition has taken a life of its own and on this formalism attempts to impose sharp boundaries even where they do not exist. Particularly in differentiated product markets, mechanical market definition risks weakening the analysis rather than strengthening it and there are risks of misleading conclusions”.

Consequently, the importance attached to market definition is somewhat different across the U.S. and EU legal systems. In the U.S., a tendency of diminishing dependence on this exercise can be seen,<sup>68</sup> in what has become known as the ‘first principles approach’.<sup>69</sup> This approach emphasises the analytical traps

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65 J. Ordover and D. Wall, *Understanding Econometrics Methods of Market Definition*, 3 *Antitrust* 20 (1989).

66 J.B. Baker, *Contemporary Empirical Merger Analysis*, 5 *George Mason Law Review* 347, 351 (1997).

67 M. Katz, former Deputy Assistant Attorney General in the antitrust division of the U.S. DOJ, Quoted in Hutchinson (2005), *op. cit.*

68 Particularly among economists. Compare, however, with R. Pitofski (former Chairman of the FTC), *Staples and Boeing: What They Say About Merger Enforcement at the FTC*, Prepared remarks before Business Development Associates (September 23, 1997).

69 S.C. Salop, *The First Principles Approach to Antitrust, Kodak, and Antitrust at the Millennium*, 68 *Antitrust Law Journal* 187 (2000).

and factual errors associated with market definition, and instead centres on an examinations of the demonstrated competitive effects of the conduct at hand. Consider, for example, merger investigations. Recent advancements in economic theories underpinning unilateral effects allow competition authorities to predict the likelihood and magnitude of a post-merger price increase, thereby superseding the traditional market definition and market share analysis.<sup>70</sup> It has been thus argued that empirical analysis can gauge the anti-competitive concern directly, without having to turn to indirect structural indicators.<sup>71</sup>

Nonetheless, adherence to the legal requirement of delineating the relevant market is still largely demanded by the courts. In the U.S., a failure to establish a clear-cut definition may result in the case being discounted, and even in the dismissal of the claim. In fact, the U.S. DOJ lost its case to prohibit the recent \$7.7 billion acquisition of *PeopleSoft* by *Oracle*, since it failed to meet the burden of proving the distinct and narrow product and geographic markets alleged in its initial complaint. Although the court explicitly acknowledged the inherent difficulty associated with the need to “identify clear breaks in the chain of substitutes sufficient to justify bright-line market boundaries in differentiated products”, it contended that in the absence of a clear market definition it cannot implement the concentration methodology of the Guidelines.<sup>72</sup>

Similarly, a shift in the focus from the intermediary stage of market definition to its ultimate objective, has not been adopted thus far in the EU, and defining the relevant market continues to form an obligatory step in the evaluation.<sup>73</sup> As eloquently expressed by one commentator:<sup>74</sup>

“The case law seems to require market definition, and it seems to require a stepwise approach in which market definition precedes analysis of competitive effect. One can only imagine the blizzard of quotations from ... cases that would confront any agency effort to do otherwise”.

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70 See for instance J.B. Baker and T.F. Bresnahan, *The Gains from Merger or Collusion in Product Differentiated Industries*, 33 *Journal of Industrial Economics* 427 (1985); G.J. Werden, *Simulating the Effects of Differentiated Products Mergers: A Practitioners' Guide*, Department of Resource Economics, University of Massachusetts (1997). See also the detailed discussion in Chapter 4.

71 Coppi and Walker (2004), *op. cit.*, at 104-105; Van den Bergh and Camesasce (2006), *op. cit.*, at 123-125.

72 *U.S. v. Oracle Corporation* 331 F. Supp. 2d 1098 (2004), at 1158-1161.

73 Interestingly, the International Chamber of Commerce, *The World Business Organization, Commission on Competition*, Comments on the Reform of the Application of Article 82 of the EC Treaty (December 12, 2005), at 7-8, has recently expressed the view that whilst market definition remains a crucial part of the analysis in Article 82 cases, this exercise may be somewhat relaxed in Article 81 and merger investigations.

74 Blumenthal (2004), *op. cit.*



Thus, it seems appropriate to reckon the following lines articulated by the prominent economist Dennis Carlton:<sup>75</sup>

“Market definition and the market shares based on it continue to be a central focus of many antitrust cases. This is so despite the well understood limitations of such a methodology in providing an accurate guide to the competitiveness of an industry. The simplicity of the methodology is both its strength and weakness. Its strength is that it is easy to understand and seems intuitively correct—high market shares indicate that competition is weak, while low ones indicate the reverse. The weakness of the methodology is its failure to identify when high market shares may in fact not convey accurate information about an industry’s competitiveness, or conversely when low market shares can mask a lack of competition. Although some may call for the elimination of the methodology as an analytic tool because of its limitations, its great strength is that it may prevent decisionmakers from making egregious errors”.

In conclusion, it is doubtful whether antitrust authorities on either side of the Atlantic would part with market definition in the near future. In the absence of a meticulous formulation of the myriad of ways in which economically-driven conclusions may be converted into legal definitions, the relevant market is likely to remain an algorithm for structuring one’s thinking, and a useful tool in recognising where ‘the battle is fought’.

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75 D.W. Carlton, Market Definition: Use and Abuse, 3 Competition Policy International 1, 4 (2007).



# Samenvatting

## **Definitie van de relevante markt: (dis)harmonie tussen economie en mededingingsrecht**

In het afgelopen decennium zijn de rol en het belang van de economische analyse van het mededingingsrecht in de Europese Unie toegenomen. De juridische vraag, of het misbruik door een dominante onderneming betreft of vermindering van concurrentie als gevolg van fusies, is in essentie een economische vraag, zodat mededingingsautoriteiten de onderzochte markt door een economische bril moeten analyseren. De economische wetenschap kan een normatieve maatstaf bieden voor het uitvoeren van mededingingsbeleid, het kan helpen bij het verduidelijken van de betekenis van diverse juridische begrippen, de relevante onderwerpen structureren en de analyse preciseren. Voorts biedt het waardevolle inzichten in de effecten van diverse marktstructuren, de prikkels en het gedrag van bedrijven en de efficiëntie of welvaartseffecten die daar het gevolg van zijn. Bovendien kan de economische wetenschap wellicht belangrijke bewijsvragen beantwoorden, waardoor juridische voorspellingen nauwkeuriger worden. De economische wetenschap kan dus worden gebruikt om de plausibiliteit van verschillende juridische situaties te beoordelen, om het gedrag van spelers op de markt te simuleren en om de voorwaarden te verduidelijken waaraan moet zijn voldaan om de juridische vereisten te vervullen die van belang zijn voor de betreffende zaak.

De conformiteit van het mededingingsrecht met economische beginselen blijkt uit talrijke recent geïmplementeerde hervormingen in verschillende delen van mededingingsbeleid, alsmede uit de *'more economic approach'* van de Europese fusiecontrole. Bovendien is er in toenemende mate sprake van economische expertise bij mededingingsfunctionarissen, met name na het oprichten van de *Chief Economist's Office* en zijn team van gespecialiseerde economen in 2003. Op het terrein van marktdefinities, de primaire focus van dit boek, werd de overgang naar meer economisch georiënteerde methoden ingezet door de uitvaardiging van de Bekendmaking van de Commissie uit 1997 inzake de bepaling van de relevante markt, welke een economische test introduceerde voor de marktafbakeningsprocedure.

Ondanks deze ontwikkelingen blijft het een uitdagende taak om economische beginselen in het bestaande mededingingsrechtelijke kader te incorporeren. Veel ‘traditionele’ juristen en rechters lijken afkerig van het accepteren van empirisch bewijs, vaak op basis van onvoldoende gegevens, wat het gebruik van kwantitatieve instrumenten belemmert. Door de toenemende wederzijdse afhankelijkheid van recht en economie in mededingingsanalyses vereist het correct toepassen van juridische principes voorts een bepaalde mate van economische vakkundigheid, die niet alle juridische beoefenaars van het mededingingsrecht noodzakelijkerwijs bezitten.

Doel van dit project is het bereiken van een betere integratie van industriële economie en mededingingsrecht, door steekhoudende theoretische grondslagen te bieden voor het afbakenen van antitrust markten en het bepalen van marktmacht, alsmede het aanduiden van het relevante empirische bewijs dat nodig is om dit raamwerk in de praktijk toe te passen.

Dit boek onderzoekt in het bijzonder de toenemende rol van economisch georiënteerde benaderingen in het stadium van de marktafbakening, welke een essentiële rol speelt in de meeste mededingingsrechtelijke onderzoeken en welke vaak het middelpunt vormt van onderzoek naar de aard van de mededinging in een bepaalde bedrijfstak. Een succesvolle opname van economische benaderingen in de toepassing van marktdefinities is derhalve afhankelijk van het voldoen aan twee voorwaarden. Ten eerste moet het reguleringskader dat door de Europese Commissie wordt gehanteerd in lijn zijn met de economische theorie waarop de definitie van de relevante markt is gebaseerd. Ten tweede moet de Commissie alle beschikbare kwantitatieve technieken correct toepassen.

Om goed te kunnen evalueren of de Europese besluitvorming wordt ondersteund door het gebruik van een juiste economische analyse, onderzoekt dit boek de volgende vragen:

- (1) Is de ‘*more economic approach*’ die de Europese Commissie volgt in overeenstemming met de theoretische economische inzichten betreffende marktdefinities?
- (2) Benutten de uitspraken in Europese mededingingszaken alle relevante empirische maatstaven?

Het boek begint met een inleidend hoofdstuk, waarin de relevante vragen uit deze studie worden gepresenteerd. Deze omvatten onder meer de toenemende rol van de economische wetenschap in mededingingsbeleid en de determinanten van dit proces; de sleutelpositie van de marktdefinitie in de Europese rechtspraktijk;

de potentiële bijdrage van kwantitatieve analyse en de voorwaarden voor succesvolle implementatie hiervan.

Hoofdstuk 2 van dit boek richt zich op de economische fundering van het Europese mededingingsrecht met betrekking tot een van haar meest kenmerkende doelen: het handhaven van effectieve mededinging en het elimineren van mogelijke inefficiënties als gevolg van marktmacht. Het hoofdstuk onderzoekt de indicatoren van marktmacht en de middelen waarmee het wordt gedefinieerd en opgespoord. In deze context worden fundamentele economische concepten zoals volledige mededinging, monopolie, oligopolie en productdifferentiatie besproken. Voorts behandelt het hoofdstuk het Structuur-Gedrag-Resultaat paradigma en de overweldigende invloed hiervan op de Europese besluitvorming. Deze benadering heeft aanleiding gegeven tot het ontstaan van een indirect structuralistisch raamwerk voor het beoordelen van marktmacht, dat is gebaseerd op de notie van een relevante markt, en daaruit voortvloeiend een analyse van marktaandeelen, concentratie en toetredingscondities. Het SGR-paradigma heeft aldus de definitie van de relevante markt centraal gesteld in mededingingsanalyses. Terwijl de hedendaagse economische theorie zich iets van de SGR-basis heeft teruggetrokken, blijft de structurele nadruk de juridische praktijk in grote mate dicteren. Europese rechters hebben in veel zaken de rol van de marktdefinitie benadrukt als zijnde essentieel voor alle aspecten van mededingingsrecht, alvorens enige juridische overtreding kan worden vastgesteld. Het structurele gezichtspunt met betrekking tot mededingingsrechtelijke problemen blijft dus in grote mate intact, ook al is deze indirecte methode door recente ontwikkelingen in econometrie en statistiek verouderd.

Aansluitend op de beschrijving van de economische funderingen van de marktdefinitie bevat Hoofdstuk 3 een grondig onderzoek naar de juridische grondslagen van de marktdefinitie in het Europese mededingingsrecht. Het hoofdstuk behandelt de heersende juridische benadering van marktdefinitie als instrument voor het vaststellen van marktmacht, haar geschiedenis, reikwijdte, voordelen en mogelijke valkuilen. Het primaat van de relevante markt als coherente methodologie wordt toegeschreven aan de Amerikaanse rechtspraak, die wordt geleid door prominente precedents van het *Supreme Court*. Ook bieden de eerste Amerikaanse *Horizontal Merger Guidelines* en de daarop volgende herzieningen voor het eerst een compleet analytisch kader voor het identificeren en elimineren van fusies die marktmacht kunnen creëren of versterken. Tegen deze achtergrond heeft de Europese jurisprudentie marktdefinitie getransformeerd van een loutere (vaak subjectieve) evaluatie van vraagsubstituten in het meer economische kader dat tegenwoordig door de Europese Commissie wordt gehanteerd.

Het hoofdstuk wijdt bijzondere aandacht aan de Bekendmaking uit 1997 betreffende marktdefinitie en de belangrijkste voorwaarden daaruit. De Bekendmaking postuleert het concept van een relevante markt als zijnde samengesteld uit een groep van producten en een geografisch gebied, en het voert de analyse langs de drie hoofdbronnen van competitieve beperkingen die het gedrag van ondernemingen beïnvloeden: substitutie aan de vraagzijde, substitutie aan de aanbodzijde en potentiële concurrentie.

Om de relevante combinatie van producten en regio's te bepalen die het gedrag van de onderzochte onderneming effectief beperken, introduceert de Bekendmaking de van origine Amerikaanse SSNIP-test, die ook bekend staat als de *hypothetische monopolist*-test. De test gaat uit van een kleine hypothetische, blijvende verandering van de relatieve prijs van het betreffende product, in de orde van grootte van 5-10%, en evalueert de verwachte reacties van consumenten op die stijging. Als consumenten hun aankopen in een ander gebied kunnen doen of kunnen overstappen op andere producten, zodanig dat de prijsstijging onrendabel is vanwege het verlies aan omzet, dan vormt de onderzochte verzameling producten geen kandidaat-markt voor mededingingsrechtelijke doeleinden, en moeten additionele substituten en gebieden worden toegevoegd aan de voorgestelde marktdefinitie. Dit proces van het toevoegen van het op een na beste substituut en het verruimen van de groep van producten van de hypothetische monopolist moet worden voortgezet totdat de kleinst mogelijke set van producten en geografische gebieden is gevormd waarin een kleine, blijvende stijging in de relatieve prijs niet zou leiden tot aanzienlijke substitutie, zodat deze winstgevend zou zijn.

Verdere stappen in de richting van rigoureuze economische analyse zijn gezet door het registreren van kwantitatieve technieken die geschikt zijn om markten mee af te bakenen: schattingen van (kruiselingse) vraagprijselasticiteiten, analyse van prijzen en prijstrends, handelsstromen en vervoerstests.

Ondanks het meer economische ontwerp kent de Bekendmaking enkele valkuilen die het risico meebrengen dat de marktdefinities van de Commissie vertekend raken en de kwaliteit wordt aangetast. Deze valkuilen worden in detail besproken, tezamen met additionele complicaties rond de juridische methodologie indien deze wordt toegepast op specifieke marktdefinitieproblemen, zoals het toepassen van de SSNIP-test in zaken van misbruik van economische machtspositie en marktdefinitie in hoog-technologische markten.

Hoofdstuk 4 biedt een uitvoerig onderzoek naar de empirische technieken die worden gebruikt bij de marktdefinitie. Ze spelen een cruciale rol in dit proces, omdat ze een objectief instrument vormen waarmee de mate van concurrentie tussen producten kan worden gemeten. Ook reduceren ze de inherente

afhankelijkheid van de inschattingen van partijen, of de noodzaak om te vertrouwen op theoretische hypothesen en subjectieve oordelen. Een breed scala aan technieken, de een meer en de ander minder geraffineerd, wordt geïntroduceerd en uitvoerig geanalyseerd. Ze variëren van eenvoudige analyses van prijzen en prijstrends, transportkosten en vervoerstests tot vraaganalyses en verschillende mededingingsmodellen. Elke techniek wordt op haar merites, haar sterke en zwakke punten beoordeeld. Ook wordt uitgebreid ingegaan op de toepassingen in mededingingsrechtelijke onderzoeken.

Naast het behandelen van de empirische methoden die het meest frequent worden toegepast door de Europese Commissie, biedt het hoofdstuk tegelijkertijd een uitgebreid overzicht van vrijwel alle kwantitatieve methoden die binnen en buiten de EU worden gebruikt, om zo mededingingsfunctionarissen goed op de hoogte te brengen van de economische instrumenten die tegenwoordig beschikbaar zijn om markten mee te definiëren.

Hoofdstuk 5 onderzoekt of de Europese mededingingsrechtelijke praktijk, zoals deze uit de belangrijkste rechtszaken naar voren komt, een beslissingsproces vormt dat overeenkomt met de economische inzichten uit de voorgaande hoofdstukken. Om de volledige invloed van de economische benadering te kunnen analyseren, is een aantal geselecteerde rechtszaken onderzocht om zo vast te stellen in hoeverre bij het definiëren van de markt voldoende economische argumenten worden toegepast.

Ook wordt, bij het vergelijken van oudere en recentere zaken, onderzocht of de Bekendmaking uit 1997 een echte verandering in de benadering van de Commissie heeft teweeggebracht, vergeleken met de oudere, ‘traditionele’ methode.

De analyse wordt chronologisch uitgevoerd, om de ontwikkeling van de Commissie bij het definiëren van de markt duidelijk te maken. De meest prominente beslissingen worden besproken, waaronder de EHvJ-zaak *United Brands*, een van de eerste zaken betreffende marktdefinitie en marktmacht in de Europese rechtspraktijk; *Nestle/Perrier*, welke het gebruik van prijstrends en vervoerstests toelicht; *Kimberly-Clark/Scott*, welke het gebruik illustreert van vraagelasticiteiten om de markt af te bakenen; en het *Cruise Ship* fusieonderzoek, dat de mogelijke bijdrage van ‘*critical loss analysis*’ onderstreept.

Hoofdstuk 6, tenslotte, vat de analyse uit het boek samen, brengt de resultaten van het onderzoek samen, trekt enkele algemene conclusies en geeft aanbevelingen voor toekomstig mededingingsonderzoek.

Aan het eind van het onderzoek gekomen, worden de vragen die de kern van dit boek vormen, beantwoord. Ten eerste heeft de Bekendmaking uit 1997 weliswaar het vermogen om de Europese mededingingsrechtspraktijk het economische domein binnen te loodsen, maar die belofte is niet volledig waargemaakt. Het definiëren van de markt volgens de Bekendmaking kent een aantal tekortkomingen, die de kwaliteit van de analyses van de Commissie kunnen ondermijnen.

Zo erkent de Bekendmaking weliswaar het beperkende effect van aanbodsubstitutie als zijnde effectief equivalent aan dat van vraagsubstitutie, maar het past de SSNIP-test niet toe op de eerste vorm. Er wordt geen duidelijke economische argumentatie voor deze omissie aangedragen. In veel rechtszaken van de Commissie, alsmede in de Bekendmaking zelf, wordt de vraag of alternatieve aanbieders hun prijs winstgevend en duurzaam met 5-10% kunnen verhogen, niet eens gesteld. De Commissie neemt veelal genoeg met het bespreken van verschillen in productie, technologie of distributiesystemen, die reacties van aanbieders commercieel onhaalbaar zouden maken.

Voorts wordt de analyse van aanbodreacties op de niet-korte termijn volgens de Bekendmaking niet in het stadium van de marktdefinitie uitgevoerd. De Commissie neemt mogelijke reacties van concurrerende aanbieders niet in overweging als deze bestaan uit het aanpassen van bestaande activa, additionele investeringen, strategische beslissingen of uitstel in de tijd. Eerst in het volgende stadium van de beoordeling van de toetredingscondities wordt aan deze overwegingen aandacht besteed. Het kan weliswaar eenvoudiger zijn om de factoren en omstandigheden die toetreding op een markt beïnvloeden pas te beoordelen als de positie van de ondernemingen op de relevante markt eerst is vastgesteld, maar het buiten beschouwing laten van potentiële concurrenten kan resulteren in een te nauwe marktdefinitie, die significante concurrentiebeperkingen negeert. In sommige markten, met name de dynamische, vormen potentiële rivalen een reële bron van effectieve concurrentie, vanwege hun mogelijkheid om ineens in de bedrijfstak toe te treden. Ze buiten beschouwing laten bij het bepalen van de relevante markt kan er toe leiden dat het beginpunt niet juist wordt gedefinieerd.

Even problematisch is de nadruk die de Bekendmaking legt op traditionele juridische bepalingen, zoals producteigenschappen en beoogd gebruik, om de marktdefinitie mee vorm te geven. Zulke overwegingen kunnen de analyse vertroebelen, de voorspelbaarheid van de marktdefinitie van de Commissie reduceren en de rechtszekerheid ondermijnen. De commissie ziet functionele uitwisselbaarheid van kenmerken als beginpunt van haar analyse, maar dit filteringproces pakt waarschijnlijk slecht uit, omdat het relevante concurrerende krachten reeds in een vroegtijdig stadium uitsluit.



Voorts is de registratie van kwantitatieve technieken, waarmee de Bekendmaking een meer accurate meting van substitutie nastreeft, totnogtoe onbevredigend. De SSNIP-test is weliswaar aanvaard als het centrale conceptuele raamwerk bij het definiëren van markten, maar de economische methoden om de invloed ervan te kwantificeren, worden niet ten volle aangewend. De reeks gebruikte technieken is beperkt en die technieken zelf zijn vrij rudimentair in vergelijking tot de mate van verfijndheid die blijkt uit de hedendaagse economische praktijk. Zoals in dit boek gedetailleerd wordt betoogd, lijden sommige van de technieken die door de Commissie worden gehanteerd, ondanks hun intuïtieve aantrekkingskracht, aan ernstige tekortkomingen, hetgeen in foutieve marktdefinities kan resulteren. Prijsrelatieanalyse, bijvoorbeeld, wordt vaak als ongeschikt aangemerkt voor marktdefinitie, omdat het een aantal valkuilen kent die haar effectiviteit en betrouwbaarheid ondermijnen. Zo kan het niet worden gebruikt om een causaal verband aan te tonen tussen de waargenomen prijsbewegingen van twee producten. Dit resulteert erin dat, zelfs als twee producten een zeer sterke correlatie vertonen, niet is bewezen dat ze één relevante markt vormen, en het sluit de mogelijkheid niet uit dat één van die producten zelf een relevante markt vormt.

Soortgelijke scepsis is op haar plaats bij het toepassen van tests betreffende handelsstromen en vervoersteps. In feite kan geen enkele omvang van fysieke beweging werkelijk garanderen dat twee gebieden elkaar beperken in de mogelijkheid tot een prijsstijging. Noch de aanwezigheid, noch de afwezigheid van significante handelsstromen tussen regionen is voldoende om aan te tonen dat de regio's al dan niet tot dezelfde geografische markt behoren. Net zoals prijsrelatieanalyses kunnen deze tests een verbondenheid tussen producten of regionen suggereren, maar ze zijn niet in staat om de exacte omvang van de relevante markt te bepalen en ze bieden geen direct antwoord op de vraag die de SSNIP-test stelt.

Tegelijkertijd zijn meer ontwikkelde economische inzichten, zoals de *critical loss analysis* of fusiesimulaties niet doorgedrongen tot de formulering in de Bekendmaking. Hoofdstuk 4 van dit boek bespreekt elf van de meest vooraanstaande technieken die tegenwoordig de boventoon voeren in mededingingsanalyses, maar slechts drie hiervan zijn in de Bekendmaking opgenomen. Zo beschouwd kan de Bekendmaking, oppervlakkig gezien, weliswaar als een stap voorwaarts ten opzichte van de conventionele juridische methoden worden gezien, maar in werkelijkheid blijft achterdocht aangaande het gebruik van economische analyse aanwezig. Er kan derhalve worden geconcludeerd dat de reguleringsvoorschriften die de Commissie gebruikt niet in overeenstemming zijn met de economische theorie die ten grondslag ligt aan de definitie van de relevante markt. Nu de Bekendmaking haar tiende verjaardag nadert, kan de Commissie worden opgeroepen tot het uitvaardigen van een nieuwe Bekend-

making betreffende marktdefinitie, die de weg vrijmaakt voor een werkelijke ‘*more economic approach*’ in het besluitvormingsproces van de Commissie.

Ten tweede bevestigen beslissingen in Europese mededingingsrechtzaken dat de Europese mededingingsrechtelijke praktijk tekortschiet bij het benutten van alle relevante empirische maatstaven. Ook al heeft de Bekendmaking uit 1997 de SSNIP-test effectief aangewezen om de marktdefinitie te beheersen, de Commissie volgt het SSNIP-raamwerk niet zo routinematig als zou mogen worden verwacht. In het transatlantische *Cruise Ship* fusieonderzoek, om een voorbeeld te geven, verwijst de Commissie wel kort naar de SSNIP-test, maar wordt deze snel terzijde geschoven ten faveure van een traditionele analyse van marktvoorwaarden.

In de context van de geografische marktdefinitie wordt de test zelfs nog lichtzinniger toegepast. Ook al wordt SSNIP-methodologie in de Bekendmaking voor zowel de product- als de geografische relevante markt in aanmerking genomen, in de praktijk is de implementatie (impliciet of expliciet) van de test veel duidelijker en beter gestructureerd bij het definiëren van productmarkten. Veel geografische referentiemarkten worden dus gebaseerd op basis van homogeniteit van de mededingingsvoorwaarden die zich in een bepaald gebied voordoen, op een wijze die overeenkomst vertoont met de benadering van producteigenschappen bij productmarkten.

Voorts past de Europese Commissie empirische analyses niet zo voortvarend toe als de Amerikaanse mededingingsautoriteiten, terwijl het gebruik van empirische methoden toch wordt gezien als een van de belangrijkste vooruitgangen in de mededingingsanalyse in de EU en de U.S. Het onderzoek van EU-zaken dat in Hoofdstuk 5 is uitgevoerd, bevestigt dat feitelijk bewijs (dat wil zeggen, niet-economisch bewijs) het belangrijkste blijft voor de Commissie. De *Nestlé/Perrier*-beslissing uit 1992 bijvoorbeeld gaat in op consumentenmotivatie, de perceptie van het product en het beoogd gebruik, tezamen met productie- en distributiecondities en de visie van de detailhandel. Ook in de *Procter & Gamble/Schickedanz*-zaak uit 1994 wordt een hele opsomming van kwalitatieve overwegingen gegeven, waaronder producteigenschappen, materialen, gebruiksmogelijkheden, consumptievoorkeuren en gebruikspatronen. In de meest recente *Cruise Ship* fusie, van na de publicatie van de Bekendmaking, wordt niet van deze praktijk afgeweken. Het lijkt er op dat de Commissie haar toevlucht neemt tot de meer intuïtieve instrumenten, die geen specifieke economische expertise vereisen, Dit kan echter ten koste gaan van de analytische nauwkeurigheid van de SSNIP-methodologie uit de Bekendmaking van 1997.

Veel beslissingen van de Commissie missen dan ook analytische nauwkeurigheid, in die zin dat ze zich niet richten op de mogelijkheid van de

onderneming om de prijzen winstgevend te verhogen boven het concurrentiële niveau. Evenmin streven ze serieus naar het kwantificeren van dat effect. De fase van marktdefinitie biedt veeleer een informele en soms onsamenhangende presentatie van functioneel uitwisselbare factoren, prijzen en kwaliteitsvergelijkingen.

Zo'n benadering opent de mogelijkheid van verregaande juridische willekeur en scheidt het gevaar van te nauw gedefinieerde markten. Voorts brengt het de betrouwbaarheid en controleerbaarheid van de mededingingsanalyse in gevaar.

Samenvattend, ook al heeft het Europese mededingingsrecht zich verwijderd van haar traditionele oorsprong en haar exclusieve afhankelijkheid van subjectieve juridische criteria, de 'modernisering' van het definiëren van de markt – in overeenstemming met de groeiende wereldwijde vraag naar empirische input in mededingingsanalyses – is nog niet compleet. De conclusie is dan ook dat, voor wat betreft het toepassen van empirische instrumenten, de kloof tussen theorie en praktijk nog steeds grotendeels aanwezig is.



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## Curriculum Vitae

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