

Innovation and competition policy

Part I – conceptual issues

Economic Discussion Paper 3

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Report prepared for the Office of Fair Trading
by Charles River Associates

PREFACE

This report was jointly commissioned by the Office of Fair Trading (OFT), Department of Trade and Industry (DTI) and Office of Telecommunications (OFTEL) from Charles River Associates. They were asked to examine the role and application of competition policy within markets characterised by large scale product and service innovation.

Any views expressed are those of the authors and they do not necessarily reflect the views of the OFT, DTI or OFTEL. This report is not and should be not treated as a guideline issued as a consequence of the Director General's obligation to publish general advice and information under the Competition Act 1998.

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The OFT would welcome suggestions for future research topics on aspects of UK Competition and Consumer Policy.

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1 EXECUTIVE SUMMARY

- 1.1 The subject matter of this report is potentially as broad as the field of competition policy and enforcement and takes on all the cutting edge issues from the underlying philosophy to the final design of remedies in enforcement cases. To make it manageable we have had to be very disciplined regarding what questions we address and how deeply we address them. The guiding rule has been to focus on how the characteristics of new economy¹ industries raise new issues for competition policy and enforcement and how these issues can be and have been addressed by the competition and antitrust authorities on both sides of the Atlantic.
- 1.2 Most practitioners recognise that the traditional approach to competition policy issues of defining the relevant market, assessing the existence of market power or dominance, and then considering whether a particular behaviour or merger is anti-competitive can be seriously flawed in some circumstances. These circumstances are likely to arise more often in high technology markets than in more standard markets (eg, what is the usefulness of a five to 10 per cent hypothetical monopolist price rise test for market definition when competition is based on drastic innovations leading to the replacement of the current dominant firm, not on price competition between competitors?). For this reason we advocate (generally, but particularly in high technology industries), a ‘first principles’ approach to competition policy.

The ‘first principles’ approach centres on an examination of the competitive effects of the conduct at issue. This is appropriate because competitive effect is the true core of antitrust. Although market power and market definition have a role in antitrust analysis, their proper roles are parts of and in reference to the primary evaluation of the alleged anti-competitive conduct and its likely market effects. They are not valued for their own sake but rather for the roles they play in an evaluation of market effects. (*Salop, 2000*)

We believe that the ‘first principles’ approach as described by Salop that focuses the analysis of anti-competitive conduct directly upon the alleged conduct itself and on the effects of that conduct is not only appropriate for the analysis of anti-competitive behaviour generally, but that it is particularly well suited to the

¹ The term ‘new economy’ is used as shorthand throughout this report to refer to industries with characteristics such as large scale technical innovation and network effects which might pose different challenges for competition policy. It should not be taken to imply that all new industries require special treatment with regards to the application of competition policy.

analysis of alleged anti-competitive conduct in the new economy. It provides the framework and flexibility for appropriately considering competition issues in the new and old economies.

- 1.3 One of the corollaries to this is that we need to expand our definition of market power to include the power to exclude in addition to power over price. The competitive issues that arise in dynamically competitive industries often involve exclusionary power rather than pricing power. In a competitive environment where competition is primarily innovation driven and based on the introduction of new products and features and only secondarily based on price, it is not surprising that most of the allegations and concerns about anti-competitive behaviour relate to actions or agreements that threaten to exclude competitors or to tilt the playing field through the adoption of an anti-competitive strategy. Such behaviour will allow a firm or group of firms to achieve, maintain, expand, or extend a dominant position. Therefore the focus of the analysis has to be on exclusionary behaviour. Note that this is appropriate also for many cases that arise outside the new economy.

Characteristics of the new economy

- 1.4 Different economists categorise the characteristics of the new economy that are relevant for competition policy slightly differently. However there is a generally agreed upon set of characteristics of these new economy industries that are considered to be important for competition policy.

R&D AND INTELLECTUAL PROPERTY

- 1.5 It is investment in R&D that produces the new technology and ideas that are at the heart of innovation. Intellectual property, therefore, plays a major role in competitive strategy in high technology industries and competition policy needs to recognise this. In particular, competition policy issues to do with patenting and licensing intellectual property become very important in highly innovative industries.

NETWORK EFFECTS

- 1.6 High technology markets are often characterised by significant demand-side network effects which lead to a tendency for markets to 'tip' to a single dominant vendor or technology. In markets that tip, competition is **for** the market, not **in** the market, and the market is likely to end up highly concentrated. The incentive is therefore to gain the upper hand and become the predominant player as early possible, which can be expected to lead to particularly vigorous competition. Given this incentive, it is not surprising that firms go as far as to give away products such as software. When all firms, large and small, engage in such

tactics with the objective of winning the race to monopoly, it becomes extremely difficult for a competition authority to analyse predatory behaviour using conventional methods.

- 1.7 Closely related to this, when competition with such high stakes is taking place, firms can be expected to use all tactics available to tilt the playing field their way. When the choice is either to win big, or lose out altogether, it will pay to be particularly aggressive. Practices such as tying, exclusive dealing and various other predatory methods may be used if available, and can be more effective than usual if they are able to tip the balance in the market at the critical time. If they can change the competitive situation even temporarily, network effects may make their advantage permanent. Under some conditions these practices can be used by a firm that is dominant in one market to tip the market for a related product in its direction, even if its variant of the product is an inferior one.
- 1.8 The key conclusion from this is that competition authorities need to focus on trying to ensure that an undistorted process of rivalry takes place and in particular is not threatened by existing monopolists trying to deter rivalry. Note that there are likely to be more methods open to monopolists to deter rivalry and reduce competition in high technology markets. For instance, the scope for predation is dramatically increased and the economics of predation can be significantly altered (eg, withholding technical information necessary to a rival may be a very effective, and **costless**, method of predating).

HIGH FIXED/SUNK COSTS AND LOW MARGINAL COSTS

- 1.9 Markets with very high sunk costs and low marginal costs are likely to be highly concentrated, to involve a large amount of price discrimination (in order to try to recover the sunk costs) and to exhibit high margins. Competition authorities are traditionally concerned by all three of these issues. They will need to ensure that they do not mistake the natural consequences of the cost structure of the industries for genuine competition concerns.

TECHNICAL COMPLEXITY, COMPATIBILITY AND STANDARDS

- 1.10 High technology markets are often characterised by high levels of technical complexity and the need for complementary products to work together. These characteristics lead to a need for firms to cooperate to ensure that products interoperate. Competition authorities have also, quite properly, traditionally been concerned about cooperative behaviour. However, such cooperation over standards can ensure that there is competition within a market between different providers of products using the same standard, rather than just competition for the market followed by (near) monopoly.

Unilateral effects

PREDATION

- 1.11 The nature of predation is often significantly different in high technology markets. The standard price tests based on marginal, variable or avoidable costs are likely to be unhelpful when fixed costs are very large and marginal costs are close to zero. In one sense, such tests are likely to be far too permissive: they would allow pricing in response to a new entrant that could not possibly be the rational response except for the anti-competitive benefits of exclusion. In another sense such tests are not permissive enough: when competition is for the market, very low penetration pricing may be a perfectly rational and pro-competitive form of competition.
- 1.12 The standard idea behind predation is that the predating firm incurs costs in the short-run (typically losses) which it recoups in the long-run once it has induced exit. However, in the new economy predatory acts may be costless (eg, predatory vapourware announcements) or even cost-saving (eg, refusing to share information necessary for a competitor to compete).
- 1.13 We therefore propose a non-price test based definition of predation. Our definition is that predation occurs where a firm either incurs costs or undertakes other actions which may be cost free or cost reducing, that it otherwise would not have taken had it not been for the anti-competitive benefits to the firm undertaking these actions.

TYING/BUNDLING

- 1.14 In the context of dynamic industries, issues that need to be considered that can justify tying or bundling include:
- the potential for price discrimination to lead to efficient recovery of fixed costs,
 - the need for firms selling complex systems to protect their reputations,
 - the ability of bundling to reduce prices and increase sales,
 - the potential for cost savings from bundling, and
 - rational product integration.
- 1.15 Against this one has to look for and evaluate the potential for using these practices to foreclose competition. Firms competing in markets involving large fixed (and sunk) costs face significant risk when entering markets, and require reasonable

prices and volumes to survive. Commercial practices that reduce the share of the market available for the entrant to contest, reduce the price the entrant can expect for its products or substantially raise the risk, may have considerable potential to deter entry, and reduce innovative investment in new products.

- 1.16 Clearly tying and bundling are complex issues for competition authorities and serious errors can be made if tying or bundling practices are condemned as anti-competitive without a thorough analysis of why they were used and what their competitive effects are. Tying and bundling should not be condemned as acts that serve no legitimate productive purpose, as for the most part, they have been by the US Courts. This is particularly true in high-tech dynamically competitive industries. It is highly significant that the US Court of Appeals in its decision in the Microsoft case remanded the tying case against Microsoft back to the lower court to be tried under a rule of reason analysis.

LICENSING AND MANDATING ACCESS TO IP

- 1.17 Intellectual property is the engine of growth in most high technology industries. This means that the licensing of intellectual property tends to be particularly necessary and important in such industries. Accordingly, competition authorities need to have a good intellectual framework for considering whether licenses are anti-competitive or not.
- 1.18 The key question that competition authorities should seek to answer in a licensing case is whether a license harms competition that would otherwise have occurred. This makes it very important that competition authorities consider carefully what the relevant counterfactual situation is. If the counterfactual is that a company would have issued no license, then a license that imposes restrictions on the licensee is still likely to be pro-competitive.
- 1.19 The question of whether to mandate access to IP or not is fundamentally similar to the question of whether to mandate access in standard essential facility-type cases. The question hinges on the trade-off between reducing dynamic incentives by mandating access but increasing static pricing efficiency (and potentially facilitating innovation by others).

PROFITABILITY

- 1.20 Measuring profitability is a poor way of conducting competition policy in standard industries. It is likely to be even worse in high technology industries. The very high *ex ante* risks of failure mean that the returns to 'winners' in high technology markets should be very high. We conclude that the risks of *ex post* appropriation of rewards that were not *ex ante* excessive are very high and that competition authorities should avoid using profitability measures in high technology industries.

Collective behaviour

- 1.21 The need for competitors to cooperate is not new to the new economy, but it is much more widespread than in the old economy. This is because compatibility issues are likely to be common with highly complex products and the scale of R&D required may be too much for individual firms to consider undertaking.

COOPERATIVE STANDARDS SETTING

- 1.22 Cooperative standard setting tends to move competition from being for the market to being in the market. This can be necessary to allow a product to be launched in the first place (eg, the CD format was very risky when launched and it was launched as a cooperative standard because no firm could take the risk of launching it on its own). Agreed standards, rather than competing standards, can reduce the potential wastage of 'standards competition' and can also make it easier to reap economies of scale in inputs. The two questions that a competition authority needs to ask when analysing collective standard setting are: (i) what would the world look like without the standard (no product or competing products?); and (ii) is this the least anti-competitive approach to reaping the benefits of the agreed standard.

CROSS-LICENSING AND PATENT POOLS

- 1.23 Many technology products require access to a number of intellectual property rights, which will often be held by a number of different firms. When diffuse ownership of the intellectual property needed to develop a product occurs, and prevents firms from developing products, this is known as a 'blocking patents' problem. Cross-licensing and patent pools are two forms of solution that help resolve the problem of blocking patents. Cross-licensing occurs when firms enter into reciprocal licensing arrangements. Patent pools can be used to remove blocking patent problems, but do so by setting up a separate entity that contains the relevant patents needed to produce a product or category of products.
- 1.24 The key question that a competition authority has to ask is whether the intellectual property rights that are being cross-licensed or pooled are substitutes or complements. When they are complements, the arrangement is likely to be pro-competitive. When they are substitutes the arrangement may well be anti-competitive.

PLATFORM JOINT VENTURES AND COOPERATIVE R&D

- 1.25 A substantial amount of innovation is conducted through joint ventures and other collaborative arrangements. Two forms of joint venture particular to high technology markets that a competition authority may encounter are platform joint ventures and cooperative R&D efforts.

- 1.26 Platform joint ventures are a feature of modern e-commerce, and often involve trading exchanges of various types moving onto electronic platforms, such as automated bank clearing houses, online stock exchanges, and airline reservation systems. The competition concerns surrounding them relate to collusion between competitors via the platform and exclusion of players who are not given access to the platform.
- 1.27 R&D joint ventures can reduce innovation competition between players. However, they are likely to be pro-competitive when the R&D will not take place in the absence of the joint venture. This may be because the risk of the R&D expenditure is too great for a single firm, or because a successful firm will find it hard to appropriate fully the rewards to the R&D (in which case the incentive to free-ride on the R&D of others is high).

Mergers

- 1.28 The most important question to ask when assessing a merger in a market characterised by a high degree of product innovation is: what is the nature of competition in this market? Does competition take place in the market or for the market? Where competition is for the market, the authorities must accept that the equilibrium is likely to have only one player and should therefore not be worried about concentration or dominance *per se*. Instead they should worry about whether a merger in such a market is likely to change the identity of the winner of the race in a way adverse to consumers and whether it is likely to slow down the timing of innovation, or significantly reduce incentives to innovate. The nature of high tech markets is such that genuine joint dominance concerns should be relatively rare. Many markets will have only one significant player and so almost by definition cannot give rise to joint dominance concerns. Where competition is in the market, not for the market, the cost conditions of these markets may well give rise to relatively few players, but will also mitigate against tacit collusion due to low barriers to expansion and high margins.
- 1.29 Vertical mergers may be problematic if they lead to exclusion of rivals at one vertical level. In a market where a complementary product is very important and has only one supplier (eg, IP), exclusion may be a real concern.
- 1.30 Finally the merger standard of a substantial lessening of competition provides a more useful focus than that of dominance because often markets will have a dominant firm in any case. For many mergers in the new economy the relevant question is whether a merger will strengthen or weaken competition in the process of determining the dominant firm.

2 INTRODUCTION

Basic questions and strategy of approach

- 2.1 This report was prepared for the Office of Fair Trading and addresses the role and application of competition policy within the dynamic markets of the 'new economy.' (see footnote 1 on p1) Those markets are characterised by rapid innovation, intense competition based more on product development than on price, and intellectual property as the critical asset for competitive success. While the new economy is almost synonymous with the information technology industries, which include computer software, hardware, Internet based businesses, communications networks and associated technologies such as wireless communications, it also includes biotechnology and aerospace.
- 2.2 The basic questions addressed in this report are:
- What is the appropriate role for the OFT and other competition authorities in such markets?
 - What characteristics of these markets, and of the types of competitive process that they engender, are important for formulating competition policy?
 - How do these markets and their competitive characteristics relate to the concepts and analytical paradigm of traditional competition policy?
 - Can the traditional tools of competition policy be effectively used or easily adapted to analyse competitive issues in these markets?
 - And finally, how going forward should we modify, if at all, the tools and procedures that we use to address competition issues in industries of the new economy.
- 2.3 This report does not attempt to tell the OFT or any other competition agency or court dealing with a competition issue in a new economy industry what to conclude in any particular case. However, it does address the issues that a competition authority should consider in making such a decision. In most cases even the most careful and complete analysis will leave some room for discretion based on the weight given to the evidence and competing policy objectives within differing legal frameworks. Therefore, this report does not provide a recipe for antitrust or competition policy decision making for the new economy, but rather provides a thorough discussion of the issues that arise and the conceptual and

practical problems that these issues present. This discussion should aid the OFT in ensuring that it seeks to answer the right questions when dealing with difficult competition policy decisions in the new economy.

- 2.4 This report is divided into two parts. Part I addresses the conceptual issues; Part II consists of ten case studies that represent important illustrations of competition issues that arise in the context of the new economy. While cases will be discussed briefly in the text of Part I as illustrations of the issues and concepts, in-depth analysis of individual cases is contained in Part II. Each case study contains a statement of the basic facts, issues, and ultimate resolution as well as a statement of our analysis of the case. Table 2.1 provides an overview of the cases selected.

TABLE 2.1 – OVERVIEW OF CASE STUDIES

<i>Case</i>	<i>Category</i>	<i>Industry or Firms</i>	<i>Juris.</i>
1. Microsoft	Unilateral Conduct	Computer Software	US
2. Video Games Conduct	Unilateral/Collusive	Nintendo and Sega	UK
3. Intel	Unilateral Conduct	Computer Hardware	US
4. Dell	Unilateral Conduct	Computer Hardware	US
5. Summit/VISX	Patent Pool	Medical Lasers	US
6. Iridium	Joint Venture	Satellite Communications	EU
7. BiB	Joint Venture	Digital Interactive Television	EU
8. Adobe/Aldus	Merger – Horizontal	Computer Software	US
9. Time Warner/Turner	Merger – Horizontal and Vertical	Media – Content and Distribution	US
10. Silicon Graphics	Merger – Horizontal and Vertical	Computer Software and Hardware	US

- 2.5 This project has benefited from the fact that over the past 15 years competition authorities on both sides of the Atlantic have been grappling with and acting upon competition issues arising in industries that form the new economy. While there have been several high profile cases such as Microsoft² and Intel³, much of the competition policy development with respect to the new economy has

² United States District Court for the District of Columbia, Civil Action No. 98-1232 (TPJ), described in Part II of this report.

³ United States Federal Trade Commission, Docket No. 9288, *In the Matter of Intel Corporation* (agreement containing consent order 17 March 1999), also described in Part II of this report.

taken place in the context of other cases such as mergers or in challenges by competition agencies to aspects of cooperative practices that were considered anti-competitive. Hence, there is a rich array of cases to draw examples from.

- 2.6 Paralleling this activity has been the emergence of a substantial literature in academic and professional journals addressing competition policy issues in new economy industries and the implications of the competitive characteristics of these industries for both the paradigm of competition policy (eg, market definition, market power and dominance) and the analysis of circumstances under which intervention is appropriate or inappropriate. The discussion in this report draws heavily on that literature. While this report represents a selective synthesis of the literature, not a survey, the bibliography which has been assembled should be of substantial assistance to the staff at the OFT and to everyone with an interest in competition policy for the new economy.
- 2.7 By its very definition, the subject matter of this report is as broad as the field of competition policy and enforcement and takes on all the cutting edge issues from the underlying philosophy to the final design of remedies in enforcement cases. In this sense it is both too big and too interesting to be completed within three months and with resources commensurate with the project length. To meet the constraints of both time and budget we have had to be very disciplined regarding what questions we address and how deeply we address them. The guiding rule has been to focus on how the characteristics of new economy industries raise new issues for competition policy and enforcement and how these issues can be and have been addressed by the competition and antitrust authorities on both sides of the Atlantic.
- 2.8 To the extent that the characteristics of the new economy are amenable to standard analysis, policy alternatives, and solutions that are familiar to competition authorities, this will be pointed out, but we will not go to great lengths to develop the point. Similarly, where a characteristic of the new economy has been encountered and dealt with before, we will discuss it, but not in as great detail as if it were a characteristic of the new economy that is truly new in degree or scope and that presents new challenges to competition authorities as well as new opportunities for resolution. For example it is an essential fact of the new economy that know-how and technology are central to the competitive process and that much of this is protected as intellectual property under the patent, copyright or trade secrets laws. This gives limited monopoly rights to competitors, which can create instances of monopoly power. The granting of limited monopoly rights in the form of intellectual property rights as an incentive for investing in innovation by allowing innovators to capture more of the value of their innovation is well understood. The tension that this creates between

antitrust objectives such as the maintenance of rivalry and short term allocative efficiency is also understood. Therefore, other than to note the situation, this report has little to add to this analysis.

- 2.9 One thing that is new about intellectual property and the new economy is the frequency of cases where the intellectual property rights that need to be combined to make a complex product are owned by different firms. In this case, some form of cooperation must be undertaken among the firms to facilitate the development of the product in question. This could range across many options from having all the firms merge into one firm, to having one of the firms in question buy all of the intellectual property required to produce the product, or to having all firms cross-licence the required intellectual property to each other so that all firms could potentially produce the product. Obviously, these solutions have very different competitive outcomes. The first two produce a monopoly, and the third has more than one firm that is in a position to produce and/or license the necessary technology to produce the product in question.
- 2.10 At the same time the very characteristics of this hypothetical new economy industry, namely the necessity of having the rights to multiple pieces of intellectual property, also hold the potential key to the remedy for any monopolisation issues arising from a merger or the acquisition of all the requisite patents. One remedy would be to agree to license the necessary pool of patents to a sufficient number of competitors to guarantee the existence of competition. In the industries of today's new economy, cooperative action or mergers to solve intellectual property issues are a significant new dimension to the world of competition policy and enforcement, and licensing agreements fashioned to meet the objections of competition authorities are increasingly a part of the solution. It is these new cutting edges of competition policy and enforcement created by the intellectual property issues of today's new economy that are the focus of this report, as opposed to older issues such as the inherent tension between the granting of intellectual property rights and goals of antitrust enforcement, which are well understood, and have been accommodated in the past.
- 2.11 Having said that, we could not avoid re-addressing some of the established fundamentals of the paradigm of antitrust or competition policy analysis such as the defining of markets and the basis upon which a firm is determined to have market power or to be dominant. We ask the question: Do the standard methods of defining a market and determining the existence of market power or dominance serve us well when addressing competition issues in the new economy? We analyse issues pertaining to market definition and the determination of market power and dominance in markets that are dynamically competitive.

- 2.12 We find that there are a number of problems with the existing competition analysis paradigm, particularly if it is applied mechanically. Put differently, if a market is defined and market power or dominance is determined to exist based upon market share and perhaps some other market structure data without looking at the alleged anti-competitive violation and the circumstances surrounding it, mistakes are likely to be made. In the very complex and dynamically competitive environment of the new economy, this is even more likely to happen. This argues for what Salop (2000) calls the ‘first principles’ approach to antitrust; namely, an analysis of the alleged violation directly within the total economic context in which it takes place. Therefore, the issues raised by the new economy for competition policy also expose some existing problems with using the current antitrust paradigm for cases involving traditional industries. These existing problems become more acute in the context of the new economy. One example of this is the concept of excess or monopoly profits as a basis for enforcement action. Under many circumstances excess profits are difficult to measure reliably, and in the context of many new economy industries it is likely to be very difficult to measure excess profits or to show they exist.
- 2.13 Therefore, while attempting to focus upon the new dimensions of competition policy and enforcement that are unique to the new economy, the report has had to address some of the fundamental questions of the adequacy of the established paradigm for analysing competition issues, because some of its failings are significant to the task of formulating and enforcing competition policy in the new economy.

Structure of the report

- 2.14 To accomplish the task of addressing the issues posed by the OFT, and summarised in the five questions posed earlier, the remainder of the report is organised into five chapters.

Chapter 3, The new economy – challenges for competition policy

- 2.15 Chapter 3 addresses in some detail the fundamental nature of competition in the new economy industries and how it differs from more traditional models of competition. The chapter sets forth the characteristics of competition in these industries that have special importance for the formulation and execution of competition policy. It begins with a discussion of whether competition in these industries is most appropriately characterised by the Austrian school of economic thought, as represented by one of its foremost spokesmen, Joseph A. Schumpeter (1950). It then addresses some of the ramifications of this for competition policy. The chapter then turns to particular characteristics of industries of the new economy that are widely recognised as being significant for competition policy. These are discussed under five categories: (1) R&D and intellectual property; (2)

network effects; (3) high fixed/sunk costs low marginal costs; (4) compatibility and standards; and (5) technical complexity. In discussing each of the categories, we address their implications for competition policy.

We also discuss briefly whether, given the characteristics of new economy industries, competition law enforcement still has a role to play. We find that there is broad consensus among lawyers, economists and policy makers that competition policy can and should be applied in industries of the new economy, although with some caution.

Chapter 4, The current paradigm and the challenges of the new economy

- 2.16 Chapter 4 asks whether the existing competition laws and the paradigm for their enforcement need to be adapted to address the competition issues in the new economy, ie, can the basic competition analysis paradigm including market definition, market power, dominance, and consumer harm be satisfactorily applied in the dynamic and complex environment of the new economy. Therefore it addresses the big, contentious methodological issues. It is argued that in this environment it is important to analyse the competitive issues using the ‘first principles’ approach, which includes looking at the entire competitive environment when defining the relevant market and making a determination of market power or dominance.

CHAPTERS 5 TO 7

- 2.17 Chapters 5 to 7 discuss the application of antitrust and competition laws in three areas of enforcement:
- unilateral action by a dominant firm;
 - cooperation among firms ranging from illegal cooperative actions by competitors to restrict trade and competition to cooperative agreements among firms for legitimate production purposes such as joint ventures, standard setting, the creation of patent pools, and cross-licensing agreements, and
 - mergers in new economy industries.

Chapter 5, Unilateral behaviour

- 2.18 Chapter 5 addresses the behaviour of a dominant firm that seeks to extend the length of its dominance in one market or to expand its dominance in one market into other related markets through exclusionary behaviour, which includes predatory behaviour, tying and exclusive dealing. These are not new issues from the standpoint of antitrust enforcement. What makes the analysis more difficult is that in the complex world of, say, computer software platforms and

related software products where there are complex interfaces, network effects, and complex issues of product integration, the potential for undertaking anti-competitive actions, including predation, under the guise of legitimate business decisions may be significantly wider and more difficult to detect (as discussed in the Microsoft case study in Part II of this report). Among the specific issues considered are predation, bundling and tying, and exclusive dealing. This chapter also considers licensing and the possibility of mandatory licensing of essential facilities and the analysis of excessive profits.

Chapter 6, Collective behaviour

- 2.19 Chapter 6 considers the monitoring and enforcement of competition policy as it relates to cooperative or collective behaviour. To the extent that this addresses standard agreements between firms to restrain trade, competitive enforcement has not changed much. However, the real growth area for enforcement has been the monitoring of cooperative behaviour that is designed to promote innovation, product development, and competition. Examples of such behaviour are joint ventures, licensing and cross licensing, patent pools, and the standardisation of interconnections so that related products can work together. The challenge for competition authorities is to monitor and flag those cooperative agreements which might in some way lessen rivalry or erect barriers to competition and to ensure that these agreements are modified to eliminate or minimise their anti-competitive effects. Often the remedy to a proposed cooperative action that raises competitive concerns is to grant licences to intellectual property to other potential or actual competitors.

Chapter 7, Mergers

- 2.20 Chapter 7 argues that for the most part merger analysis has not undergone radical change when we are discussing competition within a market. The main difference has been in the effects of mergers on competition in markets for products that have not yet been developed but are in the pipeline, and concern about the monopolisation of technologies where two merging firms are the only firms with capabilities in a technology even though they are using that technology to produce products that are definitely in different markets. This has led to the concept of 'innovation markets'. Whether we consider that this conceptual construct is appropriate to maintain a semblance of the market definition paradigm, or whether these competitive concerns can be incorporated in some other way such as the analysis of potential competition, is discussed. The issues associated with innovation markets and their use provide an illustration of the difficulty of forcing all competition analysis into the market-definition market-share paradigm. Also, the importance of intellectual property, and the potential for licensing remedies, provides an additional dimension to merger analysis in high technology markets.

2.21 This chapter also makes a distinction between mergers in situations where competition is among firms for shares of the market and where competition is for the entire market. In the latter case one would expect one or at most a few firms to survive and the goal of merger policy cannot realistically be to prevent the creation of high concentration or monopoly power, but rather to allow firms to combine in ways that will promote the strongest competition for the market, with firms with the best products and services winning the day.

Fundamental conclusions

2.22 In general terms there are three broad conclusions that emerge from this analysis:

- There is a general consensus that competition policy and its active enforcement should be pursued in industries of the new economy but with some caution.
- There is a reasonable degree of agreement, which is supported by our own analysis, that the current antitrust laws and paradigm of analysis in both the EU and US, if flexibly and sensibly applied, can be used to analyse and decide competition cases in the new economy. Flexibility requires being able to adapt the analysis to the specifics of the alleged abuse and competitive conditions and avoiding *'per se'* rules against categories of conduct and mechanistic tests for concluding that a firm has or has not committed a violation. The 'first principles' approach allows this flexibility and there is some evidence that the competition authorities in both the EU and US are moving in this direction.
- This leads to the further conclusion that serious cases will almost certainly require more rather than less analysis, and that while market definition and the analysis of market power and dominance may all play a role, ultimately the analysis must focus directly on the alleged anti-competitive conduct and its anti-competitive effects. The concepts of markets, market power, and dominance must be used flexibly as tools to help the competition authorities to the right decision and not as the primary focus of the analysis itself. The practical implications of this are that effective enforcement will require more effort and analysis, and that there will be fewer simple cook-book solutions for cases in the new economy. Characteristics of the new economy, such as the dominant role of intellectual property, may open up new opportunities for remedies to competition issues, such as licensing to create desired competition.

3 THE NEW ECONOMY – CHALLENGES FOR COMPETITION POLICY

3.1 In this chapter we focus on the first two questions that we aim to answer in this report:

- What characteristics of these markets, and of the types of competitive process that they engender, are important for formulating competition policy?
- What is the appropriate role for the OFT and other competition authorities in such markets?

3.2 The first four sections of this chapter focus on the first of these questions. Paragraphs 3.3 to 3.9 outline the Schumpeterian approach (the 'Austrian school') to thinking about new economy industries. Paragraphs 3.10 to 3.13 explain why some of the very strong conclusions of the Austrian school about the inappropriateness of competition policy in industries characterised by Schumpeterian competition are not valid, while paragraphs 3.14 to 3.18 discuss the evidence that many new economy industries are correctly characterised as being subject to Schumpeterian competition. Paragraphs 3.19 to 3.61, the analytic heart of this chapter, discuss the key characteristics from a competition policy perspective of these industries. Paragraphs 3.62 to 3.66 deal with the second of the questions raised above. Finally, paragraphs 3.67 to 3.68 conclude this chapter.

Rapid change and Schumpeterian competition

3.3 The industries of the new economy have undergone rapid technical change. Firms compete for the market based upon the introduction of new and radically better products or services that give the winner a dominant market position. In this competitive process new firms will gain market leadership, and the dominant position of previous leaders will be greatly diminished or eliminated. The engine of competition is research and development to produce the technological advances that constitute the basis of the new 'killer' products that take over the market in the next generation. This form of competition is that envisioned by the Austrian school of economists who saw competition as being driven by innovation, investment, and entrepreneurship.

3.4 The Austrian school's theory of competition was best described by Joseph A. Schumpeter (1950, pp81-86) who saw the process of dynamic competition as one of 'creative destruction,' whereby innovation and entrepreneurship create new industries, often with a dominant firm. These in turn are displaced by a new generation of industries. The Austrian school views the competitive process

as a series of winner-take-all (or at least most) competitions in which the previous winners are often displaced in the subsequent round of competition. This dynamic process of innovation is seen as critically dependent upon investment in innovation and upon the role of the entrepreneur.

- 3.5 To attract entrepreneurs and venture capital into the competition, the prospects of the returns gained from being successful have to be substantial to justify this arduous and risky undertaking. Many competitors will fail. The returns must be high enough to reward investors and entrepreneurs for the considerable risk of failure, as well for entrepreneurial effort. While this is true for any investment, when the risk of failure is high and the path to success difficult, the returns to prospective winners have to be many times the normal return on capital for a potential investor to justify entry into the competition. Therefore, the potential for the winning firm to acquire a dominant or monopoly position in the industry so that it can earn short-run monopoly profits and set prices far above the short-run average costs of production may be a necessary incentive for investors to make the investment and engage in entrepreneurial activity in the first place. This school of thought does not consider monopoly prices as necessarily disadvantaging the consumer. Rather, it views them as providing the competitive long-term return needed to attract and justify the high risk of investment in innovation and the entrepreneurial activity required to bring the benefits of innovation to the modern economy.
- 3.6 It is important to understand that if, once a round of the competitive process is over and a winner is enjoying high profits, the authorities then intervene and take enforcement actions that significantly reduce those profits, this can have a very chilling effect on future investment in innovation. Such a policy will create the expectation that if you win the competitive race, the prize will be at least partly taken away by the competition authorities. More will be said on this in connection with the discussion of mandatory licensing and essential facilities and the discussion of excess profits.
- 3.7 The Austrian model of dynamic competition which corresponds in many respects with the process of competition observed in the new economy differs significantly from the static models which have constituted the standard of modern price theory, whether it be the model of perfect competition, monopolistic competition, monopoly, or models of oligopoly. All of the standard models take the technology as given and then analyse the allocation of resources in a static equilibrium and it is these static models that have been at the centre of the economic analysis of competition policy over the last thirty years. The Austrian school would argue that such static end states (equilibria) are rarely relevant in a dynamic economy, because the ongoing process of entrepreneurship and innovation means that anything approaching a static state will never be reached. What the standard economic models do tell us is that in this dynamic competitive

process prices and output will not be optimal from a short-term static view of allocative efficiency. To allow dominant firms generated by a dynamic competitive process to earn monopoly rents may be part of the price that society must be willing to pay to get the many obvious benefits that this dynamic process of innovation brings. Indeed, this trade off between more innovation and growth and short-term allocative efficiency is exactly the same as the one we face when we choose to grant intellectual property rights which is inconsistent with short term, static, efficiency.

- 3.8 The Austrian school takes the position that government intervention is rarely necessary and often counterproductive. According to David B. Audretsch, William J. Baumol and Andrew E. Burke (2001):

The Austrian school takes the view that if governments intervene to reduce the profits of winners this will reduce the incentive for existing firms and prospective entrants to engage in competitive innovation. The Austrians conclude that only where incumbent firms have substantial monopoly power and undertake little innovation should competition policy interfere and undertake regulation. But even in such cases they are sceptical about the need for regulation because the presence of large profits is likely to attract enterprising competitors who will use innovation to facilitate their entry. (p619) (Footnotes in original omitted)

- 3.9 Advocates of the Austrian school believe that temporary monopolies are a necessary part of a well-functioning dynamically competitive economy. They also believe that wherever there are monopolies, even entrenched monopolies, the existence of large profits will attract entrepreneurs who will use innovation to enter the market and compete away the monopoly profits. This will erode the position of even the most entrenched monopolist. One can understand the Austrian school's antipathy toward antitrust enforcement, because they see it as being fixated, and with some justification, on eliminating monopoly profits or rents, which is the fuel of the dynamic engine of innovation and progress.

The limits of the Austrian school's approach

- 3.10 Before raising the empirical question of 'Does the new economy work this way?' it is important to point out that this focus on monopolies and monopoly profits has caused the Austrian school to be essentially silent on what seems to be an essential question for competition policy. In order for it to be effective, Schumpeterian competition has to take place on the basis that potential competitors all have access to the competitive process, and that success is determined in the market on the basis of developing and producing a better product or service at a lower cost. This raises the question of whether it is

appropriate to prohibit competitors from taking actions, not required by their own productive activities, that exclude other competitors from the market or prevent them from getting access to the resources in the market that are required to compete?

- 3.11 The answer to this question must be 'yes.' This seems to be one of the basic issues for antitrust in dynamically competitive industries, namely, to keep the process of competition open and focused on innovation and product development rather than on blocking the potentially productive efforts of other competitors. There remain a number of additional questions to answer, such as how best to do this, but there is clearly an important role for competition policy to play in maintaining the integrity of competition in these industries. The Austrian school is largely silent on this.
- 3.12 Similarly, the position that we do not need to be worried about entrenched monopolists, no matter how they behave, because ultimately their high profits will attract entrepreneurs who, through innovation, will eventually precipitate the erosion of the incumbent's monopoly power, also misses the point. The important question is not whether every entrenched monopolist will ultimately see its position erode. The real issue is whether a monopolist or dominant firm, in an effort to preserve its position, should be allowed to use the power it has from its monopoly or dominant position to prevent potential competitors from entering the market, to deny competitors access to information and resources they may need to compete, or to engage in predatory practices designed to harm potential competitors who might potentially dislodge the entrenched firm. All these actions stifle innovation by making entry more difficult and more costly, raise the probability of failure, and therefore lower its expected return. These practices allow the entrenched monopolist to slow the process of competitive change. Such anti-competitive behaviour not only distorts competition, raises costs, precipitates inefficiency and reduces innovation, but the bottom line is that it harms economic welfare.
- 3.13 Therefore, even under Schumpeterian competition there appears to be a clear potential role for competition policy enforcement focused more on keeping the competitive process open and free of anti-competitive behaviour and agreements than on eliminating short term monopoly profits. While sometimes market conditions may limit rivalry, wherever competition can be achieved without distorting market forces, competition policy should promote it. There are good grounds for arguing that competition policy should focus less on excess profits that are difficult to measure and may in fact represent a competitive or less than competitive rate of return to the original investor. Also, competition policy should be cognizant of the fact that even dominant firms may be significantly constrained by the threat of potential competition from sources that are not easily identifiable.

Does Schumpeterian competition correctly characterise competition in the industries of the new economy?

- 3.14 However, before adopting competition policies that are tailored to the conditions of Schumpeterian competition, what is the evidence that competition in the industries of the new economy fit that model? David S. Evans and Richard Schmalensee (2001) attempt to address that issue. They take the position that the Schumpeterian process of creative destruction is alive and well not only in the new economy, but that it is transforming the entire US economy as well. Evans and Schmalensee state:

... the US economy has undergone an important transformation in the last 30 years that has resulted in much 'creative destruction' and increased investment in innovation... (p4)

...The new economy is almost synonymous with the information-technology industries. Of course, these industries, broadly defined, have been around for a long time. The Bell System, formed in the late 19th century, was a network industry created by a drastic invention and based on the transmission of information. Mainframe computers became a big business in the 1950s and was considered a mature industry by the late 1970s. But rapid increases in microprocessor speeds, decreases in the cost of providing bandwidth, and the development of the Internet have, in the last 25 years, fostered the creation of many industries that have Schumpeterian dimensions. These include computer software (eg, operating systems, applications, and utilities), computer hardware (eg, microprocessors, personal computers and servers), and Internet-based business (eg, portals, business-to-business exchanges and content providers).

There are other industries, however, that have been born or revolutionised in the last quarter century and in which dynamic competition is fundamental. These include communications networks (routers and related equipment), mobile telephony, and biotechnology. A much older industry, pharmaceuticals, has some Schumpeterian characteristics as well. (pp5-6) (Footnotes in original omitted.)

- 3.15 However, Evans and Schmalensee also recognise that Schumpeterian competition which may characterise an industry at one point in time may not continue indefinitely. Specifically, they note:

... in any particular industry, either in the new or old economy, there is no guarantee that competition through races for drastic innovations will continue indefinitely. In the US automobile industry, an initial period of rapid innovation and product development was followed by decades of

comparative stability. One might have described the auto industry in 1910 as Schumpeterian in important respects; one would not have said this in 1950. (p13)

- 3.16 Evans and Schmalensee (2001) also take the view that in industries or markets typified by Schumpeterian competition, competition policy and its analytical paradigm must recognise this and explicitly analyse the vigour of this competitive process:

Firms with market power may be able to take actions that substantially reduce competition and consumer welfare in the long run, and new economy firms may possess substantial market power. In deciding whether they do, however, it is logically necessary for courts to focus explicitly on the vigour of dynamic competition.... [A]nalysis of dynamic competition requires evidence about, among other things, the pattern of investment in developing new products (and complements thereof), the control of critical assets (particularly intellectual property and distribution channels), and beliefs (preferably as revealed by behaviour) of market participants and informed observers about the nature and pace of innovation. (p47)

- 3.17 This raises a number of issues for competition policy analysis and enforcement.

- The first is: how should one decide whether a firm is in an industry that is undergoing a Schumpeterian process of competition or whether that industry has reached a point where a more traditional model of competition within a market rather than for a market would apply?
- What evidence would one consider? Evans and Schmalensee have given us some suggestions.
- But the biggest question is: what, if any, difference should it make to the analysis or competition policy enforcement if we concluded that the competitive process was Schumpeterian in a particular case?

- 3.18 For example, suppose Microsoft were faced by the prospect of being displaced in the market for computer software platforms by a combination of technologies including a browser, the Internet, and technologies not yet developed. Should it be immune from competition laws that would prevent it from protecting against this threat by expanding its monopoly in operating systems to related software products through anti-competitive practices? Would it make a difference to the answer if there were some probability that these efforts by Microsoft would ultimately fail because of Schumpeterian competition? The answers to these questions do not appear to be obvious to everyone and we will explore them further in subsequent chapters. On first reflection, it seems that the answer is

that Microsoft should not be exempt from the antitrust laws unless the prospects of it failing to accomplish these anti-competitive goals are so immediate and the probability so high that one might choose to ignore the short-lived threat to avoid the cost of enforcement.

Key characteristics of the new economy

3.19 While most economists who address competition policy in the new economy do not refer explicitly to the Schumpeterian process of 'creative destruction,' their description of that process is essentially the same as that of Evans and Schmalensee. For example, Carl Shapiro⁴ (2000) sets forth six basic principles for firms competing in the new economy:

- **Innovation is king**

No company can afford to stand still, and ultimately performance is driven by innovation not pricing. Competition is characterised by a fierce struggle to be the next temporary monopolist.

This is a concise, and accurate description of Schumpeterian competition. He goes on to list five further principles that are central to this Schumpeterian competition as it occurs in the industries of the new economy. These are:

- **Intellectual property is becoming both 'Sword and Shield'**

When innovation is king, intellectual property rights play a prevalent role in competitive strategy.

- **Multiple versions are common**

Information products exhibit very strong economies of scale, with most costs 'first copy costs.' With large fixed costs, the need to price discriminate grows. It is not uncommon to produce various versions, with different level of specification, and significantly different pricing.

- **Complements are critical**

While there is nothing new in the need for products to be able to work together, the degree of integration in high technology markets creates the need to work closely with partners to create high technology systems.

- **Networks rule**

The role of networks, and network economics, is a defining feature of the information economy.

⁴ Carl Shapiro is a member of the Advisory Panel to this project.

- **Monopoly power lives**

There are strong forces in the information economy that favour scale. On the supply side there are strong economies of scale, and on the demand side, network effects favour popular products.

3.20 Different economists categorise characteristics of the new economy that are relevant for competition policy slightly differently. Different characteristics will be relevant for any particular competition problem, depending upon the nature of the issue and the industry in question. However there is a generally agreed upon set of characteristics of these new economy industries that are considered to be important for competition policy. These can be discussed under five categories. They are:

- R&D and intellectual property,
- network effects,
- high fixed/sunk costs low marginal costs,
- compatibility and standards, and
- technical complexity.

We discuss these each in turn.

R&D AND INTELLECTUAL PROPERTY

3.21 It is investment in R&D that produces the new technology and ideas that are at the heart of innovation and the intellectual property that becomes the primary asset of the firm along with its key employees. Intellectual property, therefore, plays a major role in competitive strategy. However, there is a real risk of expropriation if, once the innovation has been made, competitors are free to copy the innovation. For this reason, intellectual property is frequently protected by patent or copyright so that from the very beginning firms in the competitive race will, based upon the success of their R&D, get limited monopoly rights over technical elements that may be critical to the development of future products in a number of markets. In this sense they have some monopoly power over assets that they can use to develop new products, license to others, and which they can subsequently withhold in order to block others from pursuing certain avenues of product development.

3.22 In addition, investment in research and development often involves large fixed costs that (in general) are sunk costs (ie, not recoverable on exit). Further, because the outcome of research and development is highly uncertain and may

not produce anything of value, it is very difficult to determine the expected return that would be required to justify this investment. To determine this, one would have to know, among other things, the ex-ante subjective probabilities that the entrepreneur/investor put on the alternative outcomes of the investment in research and development. Since this is virtually never available, one can not know what ex-post profits would be required to justify this initial investment. As a result of this dilemma, one can not calculate the long run average cost of production, including the required return on capital, even if one could solve all the other daunting methodological and practical problems associated with their calculation. This implies that in general it is not possible to measure the existence of excess profits based upon long-run average costs.

NETWORK EFFECTS AND TIPPING

Network effects

- 3.23 Traditional so-called network industries include telecommunications, gas and electricity. These industries are based around a physical distribution network that is generally considered to be a natural monopoly. That is, assuming efficiency in production, the market is most cheaply served by a single supplier. These industries feature large fixed (and sunk) costs associated with establishing the network infrastructure, and average costs are lowest when all potential users of the service subscribe to the same network. This form of monopoly is created by economies of scale on the supply-side of the market.
- 3.24 However, there can also be demand-side network effects. In telecommunications, the more users who join a particular telephone network, the more valuable the network becomes to those users, as they are able to contact more people as the size of the network increases. This form of network effect is referred to by various writers as either a network externality, or demand-side economy of scale, where the 'economy' is the increasing value of the product to users as the size of the user base increases. The effect can be either:
- direct, where increasing the number of users of a good in turn increases the value of the good to individual users, or
 - indirect, where the increase in the value of the good is driven by the number and variety of complementary products that will be produced which in turn increases with the number of users of the underlying product.
- 3.25 Mobile phones are an example of a direct effect. The more of your friends that have mobile phones, the more useful it is to have your own mobile phone. Products such as the Sony PlayStation gaming console demonstrate indirect

effects where a particular brand of console becomes more valuable the larger the base of users as this leads to a greater the range of games being developed for that console.

- 3.26 That telecommunications is mentioned in both the above paragraphs demonstrates that both supply-side and demand-side network effects can be present simultaneously. Indeed, for high-technology industries, this is highly likely to be the case. It also demonstrates that there is nothing particularly new about network effects. Other examples of 'not so new' products that exhibit demand side network effects include fax machines and credit cards.
- 3.27 The network effects of interest here are the demand-side effects. The supply-side issues related to economies of scale and overall cost structures are discussed later, when considering cost conditions. In general, when demand-side network effects are present, large networks offer more value to users than small networks, and as a result, there is the potential to create a 'winner-take-all' situation. This can provide a particularly strong effect, leading to very large market shares for leading firms and products. The foregoing is in contrast with most industries, where, with the exception of the utility networks which are usually regulated monopolies, it is relatively unusual to encounter industries with supply-side scale economies that result in one player dominating the market. Car manufacture, for example, is subject to significant scale economies, but no network effects. So while a car manufacturer needs large production runs, given that global car markets are large relative to efficient scale, no manufacturer dominates. Manufacturing cars contrasts starkly with software, where network effects are a defining feature of competition. The more users that have access to a particular package, the more valuable that package becomes to all users, and the more likely new users are to purchase the product in most common use. Assuming comparable levels of functionality across competing packages, there is virtually no limit to this process. As a result, it is not particularly unusual to have one supplier supplying the bulk of the market for a particular application. For example, in 1997 Microsoft's Word word-processing application held more than 90 per cent of the market, as measured by shares in shipments by leading software providers (Evans and Schmalensee, 2001). The Microsoft case, discussed in Part II of this report, provides an example of network effects leading to barriers to entry. This market is characterised by both direct and indirect network effects:
- indirect: software developers are most likely to develop software for the operating system that is most popular with consumers, and
 - direct: consumers are likely to want to use the system that is most widely used by other consumers.

- 3.28 Therefore, once a particular system has become the most popular it is difficult for competitors to encourage consumers to switch to an alternative system, even if the competing system may be better, as there will be few applications available and few other users. This is called the 'applications barrier to entry.'
- 3.29 It is notable that telecommunications markets and products have not generally exhibited the impact of network effects to the same extent, a significant observation given that demand side network effects are present in telecommunications. For example, there have been global telecommunications services available for decades, but there is no single global network. Likewise, with telecommunications deregulation, competing local carriers have emerged. While these carriers face many obstacles, the small size of their network (from the customer perspective), has not been a major issue. The reason is that the ability exists to interconnect telecommunications networks with each other, and to attach products with standardised interfaces to the interconnected networks (for example, fax machines). This requires two things, technical compatibility at the interface point, and, where needed, commercial agreement on access terms. It is no accident that compatibility standards and control over interfaces has become a central feature of rivalry in high technology markets, and that these are key issues for competition authorities working in these markets.

Competition policy implications of tipping

- 3.30 As described above, when network and systems effects are present, there is a tendency for markets to 'tip' to a single dominant vendor or technology. This does not imply that one standard will win the entire market, although this is possible, but it does mean one standard often becomes predominant. Competitors that survive in such circumstances will do so by differentiating. In desktop computers for example, the PC has become dominant, but Apple still produces its Macintosh computer, and has a loyal following in some segments.
- 3.31 When tipping occurs because a particular product or system is superior, it is important to realise that the tendency to tip reflects the value to consumers of having a particular standard widely available. As such, it would be wrong to view tipping as being somehow a bad thing in general, or to see it as indicative of competition problems. However, there are number of reasons why a tendency for markets to tip might suggest both that competition authorities should keep a wary eye on such markets, and that conventional approaches to competition policy need careful consideration.
- When a single firm controls a winning standard, it may be able to gain control of the market as a whole. Furthermore, tipping is more likely to occur when competition is among systems of proprietary technologies.

- Given the nature of some high technology markets, particularly software, this may be much more feasible than in many other industries that are equally reliant on a standard. In electronics for example, where standards are important but manufacturing expensive, it would be prohibitively expensive and risky for a single manufacturer to attempt to supply the entire market, which may well be global. It is therefore not uncommon in electronics for standards to be licensed to multiple manufacturers. Examples include CDs and VHS video. The licensing firm needs to make it attractive for other firms to use their standard, rather than develop their own so there is at least some room for bilateral bargaining. Software, on the other hand, does not suffer from these problems, and can be cheaply and quickly distributed to even a large global market.
- In markets that tip, competition is for control of the market. The incentive is to gain the upper hand and become the predominant player as early possible, which can be expected to lead to particularly vigorous competition.

Indeed, any firm that is well financed could rationally expend up to the value of the expected future rents associated with winning the game, suitably adjusted for risk, in the initial battle for the market. Given this incentive, it is not surprising that firms go as far as to give away products such as software. When all firms, large and small, engage in such tactics with the objective of winning the race to monopoly, it becomes more difficult for a competition authority to analyse predatory behaviour using conventional methods.

- Closely related to this, when competition with such high stakes is taking place, firms can be expected to use all tactics available to tilt the playing field their way.

When the choice is either to win big, or lose out altogether, it will pay to be particularly aggressive. Practices such as tying, exclusive dealing and various other predatory methods may be used if available, and can be more effective than usual if they are able to tip the balance in the market at the critical time. If they can change the competitive situation even temporarily, network effects may make their advantage permanent. Under some conditions these practices can be used by a firm that is dominant in one market to tip the market for a related product in its direction, even if its variant of the product is an inferior one (Katz and Shapiro, 1998).

HIGH FIXED/SUNK COSTS, LOW MARGINAL COSTS

High fixed costs

- 3.32 To participate in high technology industries it is common that firms have to cover large fixed costs particularly those investments in intellectual property. As in any industry, fixed costs can be incurred in R&D, production, or marketing and distribution. In high technology industries, it is the R&D and production cost issues that tend to be more significant than usual.
- 3.33 The importance of R&D can be seen in the increasing level of expenditure by firms on this activity. Evans and Schmalensee (2001) report that in 1950 not one of the 100 highest valued firms spent more than five per cent of revenues on R&D. However, in 1999, 38 of the 100 highest valued firms spent at least five per cent of revenue on R&D, with 22 firms spending more than 10 per cent.
- 3.34 Software provides a good example of where set-up costs account for a large proportion of total costs. The cost of writing a program will be the same whether one copy or a million copies are subsequently sold. The marginal cost, the cost of producing and distributing one more unit or copy of the program, is likely to be low, perhaps even effectively zero for software distributed over the internet. Telecommunications also typically exhibits this form of cost structure. For example, while setting up a cellular mobile network is an extremely expensive undertaking, the marginal costs of providing particular services, such as sending a single text message, can be very low.
- 3.35 Whether fixed costs originate from R&D, production or marketing, the effect is the same. Average cost per unit sold will need to be greater than the marginal cost, in some cases by a substantial margin, if the firm is ever to earn a reasonable return on its investment. There are a number of potential issues related to this cost structure that competition authorities may have to grapple with, including:
- establishing the competitive price,
 - pricing of additional features,
 - price discrimination, and
 - a tendency toward concentrated markets.

We discuss each of these points in turn.

Estimating the competitive price

- 3.36 Much competition analysis revolves around the benchmark of a competitive market, and in particular a competitive market price. At the best of times this is a difficult concept to employ in practice. However, the larger the margin between average and marginal costs, the more difficult this exercise becomes. To highlight just one problem of the many involved, when fixed costs must be recovered, the level of margin that needs to be earned per unit sold depends itself on the number of units sold. This requires knowledge of sales throughout the entire product lifecycle. Given the high degree of uncertainty associated with forecasts of sales in high technology markets, it is highly unlikely that a competition authority could establish likely sales with the degree of certainty needed to produce a reasonable estimate of a 'competitive' price. When added to the problem of not knowing what rate of return, *ex post*, is sufficient to provide the necessary expected return (*ex ante*) for investors to undertake the investment, even if the competitive price is defined as equal to long run average costs, including the required return on capital, this figure can not usually as a practical matter be calculated.

Pricing of additional features

- 3.37 A further problem that arises is that when additional features can be provided 'free' at the margin, this can create a number of issues. For example, if it costs nothing additional to produce a copy of a fully configured version of a piece of software when compared with a version with reduced functionality that is sold at a cheaper price, is this price discrimination that should be treated as anti-competitive by the competition authorities? Alternately, if additional features are added to a software package, at no additional charge to the consumer, is this bundling of more than one product, or just rational product enhancement?

Price discrimination

- 3.38 When fixed costs are high and marginal costs are low, there are numerous ways that producers may be able to price discriminate and it is well understood this can be efficiency enhancing and not necessarily anti-competitive. For example, product prices may vary with the features made available, but perhaps little or no underlying cost differences. Prices may be set high at the initial release of a product, and then reduced over time, even though neither the cost of production nor the conditions of direct competition have changed. The need to do this arises in part from the durable nature of products such as software. Further, different users, such as businesses, consumers and students may be charged different prices for the same software package. Of course, price discrimination is not unique to high technology industries. However, when margins are large, the scale of price discrimination may also be large, bringing it to the attention of competition authorities, who may be concerned that it generates excessive

profits or distorts competition. On the other hand, competition authorities will need to weigh against any such concerns the fact that when fixed costs are high, price discrimination may be a necessary and economically efficient practice.

Tendency towards concentrated markets

- 3.39 Finally, if fixed costs are large relative to the size of the market, it will tend to mean that only a few firms can achieve efficient scale. When this factor is combined with the fact that competition for these markets will at times be of the form of winner-take-all (or most) races, plus the fact that network effects and tipping are all factors that tend to produce a large dominant firm, one would expect to commonly find new economy industries with a large dominant firm with a high market share. This is precisely what Evans and Schmalensee (2001, refer to table 3) find. High market shares exist in the pharmaceutical markets as well as in information technology markets where network effects are a predominant feature of competition. This suggests that network effects, while a contributing factor, are part of, but not the whole, story.

High sunk costs

- 3.40 The discussion above has considered the effect of fixed costs. However, many firms will also face the prospect of these costs being 'sunk' once they have been incurred. That is, if the firm decides to exit the product or market, the costs incurred will not be recoverable, and are referred to as sunk costs.
- 3.41 Sunk costs affect the nature of competition. They affect both the behaviour of potential entrants, and incumbent competitors. For potential entrants, sunk costs associated with entry create risk. Risk arises because if entry is not successful, sunk costs will convert directly to financial losses. If sunk costs are large, and the risk of failure high, then competitive entry will be very risky, and may be deterred.
- 3.42 In the Iridium case, described in Part II of this report, we examine the actions of the European Commission during their investigation of a venture (Iridium) that was characterised by large sunk costs and considerable risk. Iridium was a global communications system which used low earth orbit (LEO) satellites. To create a system that would continuously cover the globe, a constellation of 66 satellites was needed. This made Iridium an extremely expensive system, which in turn meant that a large number of subscribers would be needed to make the project commercially viable. Expanding competition from terrestrial mobile systems (cellular and mobile radio) meant that the size of the market available was very uncertain. This, combined with the fact that the entire system needed to be launched and put into operation before any real information on the likely commercial success of the venture could be gained, meant that the venture was extremely risky.

- 3.43 For incumbents, once costs are sunk, they are not relevant to competitive decision making. Competitive decisions are based on forward looking estimates of marginal revenues versus marginal costs. This means that competition can quite conceivably deliver prices below average costs.⁵ It also means that firms making accounting losses will not necessarily exit the market; exit will occur when it is believed there is no long run prospect of a net profit calculated on the basis of the net present value of forward looking marginal costs and revenues. As this forward-looking estimate will not be reflected in company accounts, accounting losses cannot generally be taken as an indicator of anti-competitive conduct.
- 3.44 Because sunk costs are not relevant to decision making, and firms may not exit even in the face of long run accounting losses, incurring sunk costs is sometimes referred to as a strategic commitment device. Once costs are sunk, an incumbent is highly committed to the market. This is important in markets that exhibit network effects, where few firms are expected to survive. Potential entrants face not only the risk of losses that are associated with entering markets where it is necessary to sink significant financial investment, but also the prospect of competing with incumbents that are committed and unlikely to exit the market. If few are expected to survive, this increases entry risk even further. Of course, this strategic commitment by the incumbent may be of little value at the critical time of the migration to the next generation of technology. At this point, all firms may have to reinvest. Indeed, entrants may have the advantage, as it is often in the incumbents interest to persevere with the existing technology for as long as possible, in an effort to harvest as high returns as possible from its existing investment. The incumbent may be at significant risk of being leap-frogged in the market by a new entrant with a new technology.

COMPATIBILITY AND STANDARDS

- 3.45 In traditional markets, where network effects are minimal or non-existent, competition turns principally upon price, quality, and service considerations. In markets in which network effects are significant, competition plays out in other dimensions as well, particularly strategies to establish, maintain, and control standards for the industry.
- 3.46 Joseph Farrell and Michael L. Katz (1998) point out that standards and compatibility are two concepts highly related to the concept of a network effect. For products produced by different firms to work together in a system, standards must exist.

⁵ In fact, there is no particular reason that prices need even be above marginal costs in the short run. All firms will compete on the basis of their long run views of the profitability of staying in the market. If there are reasonable prospects of earning long run profits, even short run marginal cost does not form a short run cost based floor.

When such standards exist, relatively 'conventional' competition is likely, revolving around price and quality. When such standards do not exist, it is more likely that tipping and competition for the entire market will ensue.

- 3.47 It is important to note that these situations are not mutually exclusive. For example, if a standard is set, such as the digital compact disc (CD) standard that replaced vinyl records, then competition in the market will take place. However, this does not mean that competitors will not strive to create other digital recording devices. Similarly, when products are not standardised, it cannot be assumed that one product will dominate the entire market. Issues such as the degree of differentiation between products, and the extent to which any single product can satisfy the bulk of consumers in the market will also be important. Whether standards are open or closed (proprietary) fundamentally changes the nature of competition.
- 3.48 Shapiro (1999) lists the following as some of the competitive implications of an open standard:
- expanded network externalities,
 - reduced technology risk for consumers, who would otherwise fear picking a losing technology and being left stranded,
 - reduced consumer lock-in to any one vendor,
 - shift in competitive focus from competition for the market to competition in the market,
 - moves competition towards price and away from features, which are at least partly standardised, and
 - leads to component competition, which favours specialists, rather than competition between entire systems, which favours generalists. (p15)
- 3.49 In markets subject to network effects consumer expectations also become critical, particularly where proprietary standards are used. This is because there is an increased risk to the consumer of picking a losing technology and being left with an obsolete, unsupported or incompatible product. Under these circumstances, firms with established reputations, well-known brand names, and visible access to capital will have competitive advantages. Other drivers of expectations also become important, such as the size of the installed customer base, and tactics such as pre-emptively announcing products before they are ready ('vapourware' in software markets) can be used to manage expectations.

- 3.50 Complements have always needed to work together to form systems. For example, vehicles need supplies of complementary products such as fuel and oils, tyres, mechanical services and so on. However, as a result of the technical complexity of high technology products and of systems of high technology products, companies can spend a great deal of time forming alliances, setting standards, and working with partners to make sure their products work together effectively as an overall system.
- 3.51 Cooperation between firms that hold intellectual property rights (IPR) is often needed when access to those rights is needed by competitors to enable new products to be brought to market. Often this is a response to the existence of mutually 'blocking patents,' where neither manufacturer can produce a product without access to the competitors' IPR. Common forms of cooperation include cross licensing, and the formation of patent pools. Cross licensing occurs when owners of two or more different IPR licence those IPR to each other. Patent pools have a similar role, but the mechanism involves licensing the IPR to a separate entity. This entity then licences the IPR to the contributing members, and in many cases also to third parties.
- 3.52 The existence of complex high-technology products and systems of high technology products create a number of significant problems for competition policy and enforcement. Complex products that require the intellectual property of several firms require that the firms must cooperate in some way or merge. In the cases of systems of products that must work together firms must communicate and cooperate. This cooperation may take many forms such as the joint setting of standards, the cross licensing of patents, patent pools, and the provision of timely information about new products that may affect the ability of firms producing complementary products to keep their products up to date and compatible.
- 3.53 First, competition authorities are accustomed to viewing cooperation among firms with suspicion. This is particularly true if those firms are competitors. They tend to look for ways that communication and joint action can be anti-competitive. This is less of a problem if the firms are producing complementary products. However, the complexity of high-tech products and particularly systems of high-tech products and the interfaces among them require a good deal of cooperation to make these industries work well and to produce products and systems of products that work well together.
- 3.54 On the other hand this complexity, interaction and mutual interdependence creates almost limitless potential for anti-competitive behaviour and the line between business decisions that may share a legitimate business purpose and outright predation can become blurred except perhaps for evidence of intent.

Further, the line between who is a competitor and who is not becomes very blurred in the Schumpeterian world of competition. One simply cannot tell where the next development is coming from that may wipe out a dominant position.

- 3.55 Thus, which firms are complementary as opposed to competitive is not always clear. Further in a world where having access to timely information, having your products compatible with the standard, and having your product able to run on the dominant network platform are important, a dominant firm can seriously damage a firm that is producing a complementary product by, for example, withholding timely information or by denying access to its platform. We believe that this is certainly anti-competitive behaviour and it is predatory behaviour if we take predatory to mean business behaviour that has no value to the firm undertaking the action except as a result of the competitive harm that it causes to an actual or potential competitor. The Microsoft case, discussed in Part II of this report, contains examples of compatibility issues leading to barriers to entry and hence raising the possibility of being used strategically to create competition problems.
- 3.56 Also, in a world of high-tech interconnectedness, such predatory behaviour may have no costs or very low costs associated with it as opposed to the more familiar concept of predatory pricing. Further, unlike the case of predatory pricing where the consumer benefits from lower prices, this is not true in the case of the predatory behaviour, which is essentially exclusionary. In a complex world, the number of avenues for such anti-competitive unilateral action by a dominant firm in the network may be limitless. Furthermore, there is no reason why such predation will not be carried out against firms that are not currently direct competitors but who are perceived as potential competitors or as easing the way for later competitors. A number of these issues are discussed further in the Microsoft case study in Part II of this report.

TECHNICAL COMPLEXITY

- 3.57 Technical complexity combined with the speed of technological change can make it difficult to apply and enforce competition policy in competitively dynamic, high-tech industries since the issues may be hard to understand and it may be difficult for competition authorities to obtain independent expert advice since many of the key people are likely to have a stake in the case.
- 3.58 In markets that are rapidly changing, there is likely to be fundamental uncertainty about possible market outcomes. Uncertainty will surround issues such as which products are in or out of the market, which products are converging over time, the likely length of product lifecycles, and so on. This type of uncertainty can seriously complicate analysis of both current and potential (or future) competition, in terms of both products and competitors. This issue is more than just an

issue of asymmetric information, where answers may exist but it is difficult for the regulator to access the relevant information. It will not be uncommon for market participants themselves to have a wide variety of views on both the current and future path of the market.

- 3.59 This complexity and uncertainty implies that it may be very hard for a competition authority to carry out an investigation and that there may be significant risks of any intervention undertaken actually being detrimental to consumers. In these circumstances it may be that this should be taken into account when setting remedies. Where a remedy could have significant perverse consequences if the competition authorities' view of the markets turns out to be incorrect, then this should be taken into account when deciding on final remedies. In particular, remedies with such a possible risk should be avoided if possible. The alternative, a strategy of caution and of watchful waiting, may be appropriate.
- 3.60 An example of a case in which the regulator adopted a 'watch and wait' strategy is the British Interactive Broadcasting case, described in Part II of this report. British Interactive Broadcasting Ltd (BiB, now named Open) is a joint venture set up to provide digital interactive TV. The prime concern raised by the Commission, among others, was that the joint venture combined BT and BSkyB, who in the view of the Commission were both potential competitors in the digital interactive television services market.
- 3.61 Rather than speculate on possible future anti-competitive outcomes, the Commission chose in this case to let the deal proceed. Effectively it allowed BT the benefit of the doubt, and elected to adopt a 'watch and wait' strategy. In our view, this was an appropriate regulatory response. If the venture significantly delayed the rollout of DSL technology in the UK, the future detriment could be quite serious. Conversely, there was no certainty that BSkyB would have been able to launch the venture alone.

Competition policy enforcement in the new economy

- 3.62 We now briefly consider the question of whether there is a role for competition policy enforcement in the new economy.⁶ Some commentators, particularly in the light of the ongoing Microsoft litigation, have suggested that competition policy should not be enforced in the new economy. However, after surveying the literature, we have found that there is near unanimity amongst informed opinion that it is important to continue to enforce competition laws in new economy industries, general confidence that the competition laws are sufficiently

⁶ Annexe C to this paper expands on this section.

robust to be adapted to deal with the competitive issues that arise in the context of the new economy, but varying degrees of optimism about the ability of the enforcement agencies and the courts to meet the challenges of cases generated by the new economy. There is also general agreement that the benefits of continued enforcement outweigh the costs. The general consensus is that we should proceed, but with caution, that we should be flexible in applying the standard competition analysis paradigm, and that we should carry out enforcement with an understanding of the special characteristics of the new economy identified in the previous section.

3.63 The case against competition policy enforcement in the new economy is neatly summarised, and answered, by Baer and Balto (1999)⁷:

The most obvious criticism of antitrust enforcement as applied to high-tech industries starts with the notion that these are fast moving industries in which today's technology is quickly outmoded, opening the way for new competitors to overturn the dominance of incumbents. If those generalisations were uniformly true of high-tech markets, then surely antitrust enforcement would be less important. Except for price fixing and other per se violations, antitrust ought to leave such markets alone, for any effort to create or exercise market power would quickly be corrected by market forces.

Of course experience shows that this caricature of high-tech markets is true in some cases and false in others. For example, even in an innovation driven market, dominance in one generation may enable a firm to gain exclusive control over critical inputs, such as software applications, allowing monopoly power to be carried over from generation to generation regardless of the relative superiority or inferiority of the incumbent's later generation of products.

While it is true that rapidly evolving technology may, in many circumstances erode entrenched interests, there may also be many countervailing tendencies that strengthen monopoly power. (p75)

3.64 In a similar vein, Professor Franklin M. Fisher⁸ (2000a, pp559-564) notes that:

There is one more issue about antitrust in innovative industries that merits discussion. It is sometimes claimed (often in connection with Microsoft's ongoing public relations campaign), that antitrust standards should not be applied to innovative industries because those industries change more

⁷ At the time of this article the authors respectively held the positions of Director, Bureau of Competition, FTC and Assistant Director, Office of Policy and Evaluation, Bureau of Competition, FTC.

⁸ Professor Franklin M. Fisher is a member of the Advisory Panel to this project.

quickly than the judicial system can act, making any monopoly power transient and any relief irrelevant.... It is true that antitrust in innovative, quickly changing industries must be carefully applied. In such industries, it would be wrong to look only at static situations – at the snapshot rather than the movie of what is going on. Hence, antitrust authorities, in deciding whether to prosecute, should consider the question of whether the situation will be self-correcting. Further, the changing nature of the industry must be taken into consideration in deciding whether acts alleged to be anti-competitive could reasonably have been directed at the suppression of competition, which is going to be effective anyway...

But it is a long way from this to a conclusion that antitrust has no place in innovative industries. Traditional antitrust analysis is and should be applicable to innovative industries. The difficulties of doing so should prompt no change in the rules, properly understood. To do otherwise is to provide a licence to destroy competition under the excuse that the firm is innovative. Moreover, hard though it may be in some cases to decide whether what is going on is, on balance, anti-competitive or simply desirable innovation, there is no escape from doing so.

3.65 Shapiro (2000) echoes these sentiments:

Some commentators have suggested that enforcement officials should leave the high-tech sector alone, since it is fluid, experiencing rapid technological change, and by-and-large displaying vigorous competition. Yet few can deny that pockets of monopoly power remain, usually associated with the control of some information bottleneck: local telephone companies, cable television operators, and Microsoft present themselves as examples, but many more companies enjoy powerful positions, often based on their control over interfaces or standards, if not genuine bottlenecks of network hubs. The leading goal of competition policy in the information economy should be to hasten the erosion of such monopoly power, and to prevent the use of monopoly power to destroy competition in adjacent markets.

3.66 He goes on to say that:

In a world of networks, where interfaces, compatibility, standards, and bottlenecks take on great significance, competition authorities cannot afford to stand on the sidelines just because innovation is rapid. To the contrary, competition authorities have a duty to prevent today's dominant firms from stifling innovation that threatens their leadership. I am hopeful that competition authorities are up to the task. Looking at the US experience, merger policy is on a sound footing, and antitrust is not impeding companies from cooperating when necessary to combine their offerings and to establish

standards. Regarding unilateral conduct by dominant firms, the Justice Department's recent action against Microsoft will likely have a profound effect on how monopolisation cases are viewed in the information economy. (p19)

Conclusions

- 3.67 In this chapter we have answered the first two questions posed in Chapter 1. We have discussed the characteristics of new economy industries that are important from a competition policy perspective and we have argued that competition policy enforcement should continue to be carried out in the new economy.
- 3.68 We now move to the question of how to adapt the antitrust enforcement paradigm to analysing competition issues in the new economy. Thus our focus turns from the analysis of the characteristics of the new-economy industries that are significant to the conduct of competition policy, to the analysis of how to account for these characteristics when analysing competition policy issues in the new economy. While it is widely agreed that competition policy and antitrust enforcement have an important role to play in maintaining effective competition in the new economy, there is less agreement among economists about whether the paradigm for analysing competition issues is well suited to addressing competition issues in highly innovative dynamic industries.

4 THE CURRENT PARADIGM AND THE CHALLENGES OF THE NEW ECONOMY

- 4.1 This chapter considers the third, fourth and fifth of the questions raised in Chapter 2. These can be summarised as: does the competition analysis paradigm used by the competition agencies and the courts need to be modified, and can it be adapted to the competitive challenge of the new economy?
- 4.2 Paragraphs 4.3 to 4.6 discuss some of the concerns expressed by commentators about the current paradigm. In paragraphs 4.7 to 4.15 we suggest an approach, referred to as the ‘first principles’ approach, that we think is well suited to analysing competition policy issues in the new economy. Paragraphs 4.16 to 4.42 highlight the fact that most competition policy analysis has traditionally focussed on a definition of market power that is based on their pricing power, whereas most competition concerns in the new economy are based on the power of firms to exclude, or raise the costs of, rivals. Paragraphs 4.43 to 4.60 discuss the correct role of market definition in new economy cases. Paragraphs 4.61 to 4.67 note that consumer harm, the concern at the heart of competition policy, may be hard to show in the short-run when abuses are exclusionary abuses but that there are good reasons to assume that exclusionary practices will cause long-run consumer harm. Paragraphs 4.68 to 4.87 then discuss the implications of the previous discussion for the correct balance between ‘*per se*’ rules and a rule of reason approach. Paragraphs 4.88 to 4.89 conclude.

Concerns about the current paradigm

- 4.3 One does not have to read far in the literature on competition policy in the dynamic markets of the new economy to realise that not everyone is as sanguine as Judge Posner, when he states that ... ‘antitrust doctrine is supple enough and its commitment to economic rationality strong enough to take in stride the competitive issues raised by the new economy.’ For example, in the lead article of an issue of the International Journal of Industrial Organisation devoted to this topic Audretsch, Baumol and Burke (2001) state that:

The evolution of industrial economics from its static base to its current dynamic form, that recognises that competition can sometimes be destructive and that firm capability plays a major role in determining market performance, raises doubts about the efficacy of current competition laws. These concerns are exacerbated by the foundation of these laws in the policy implications of static analysis. The volume of papers submitted to this symposium and the concurrence of virtually all of them with the conclusion that there are serious grounds for concern, is certainly suggestive. (p623)

- 4.4 Evans and Schmalensee (2001) see serious shortcomings of the traditional antitrust paradigm when applied to the new economy. In particular they see the process of defining markets and testing for static market power as being seriously deficient. They state that:

If antitrust is to benefit customers, in litigation involving industries in which competition has centred on investment in intellectual property both sides should be able to stipulate that the firms have static market power. It should be understood that if dynamic competition is healthy, static market power is largely irrelevant for the purpose for which market power is considered in most antitrust cases, particularly those involving charges of monopolisation: it does not provide an effective screen, and it does not summarise the relevant behavioural constraints. Thus, antitrust litigants dealing with the new economy should be obliged to offer and defend logically consistent descriptions of the current and likely future health of dynamic competition. A Schumpeterian past does not guarantee a Schumpeterian future, but it does provide relevant information. (p28)

- 4.5 They then go on to state that the standard criteria for predation and tying are, at best, far from adequate in dynamically competitive markets (pp28-48). Clearly, they believe that some serious modifications need to be made to the traditional antitrust paradigm in dynamically competitive markets and that market definition and conclusions based on a determination of market power are at the heart of the problem. Along these same lines Christopher Pleatsikas and David Teece (2001) conclude that:

There are no hard and fast indicia that lend themselves to precise definitions of markets in high technology contexts. However, the traditional indicia will typically define markets too narrowly and should not be used, at least not mechanically.

In their place, a qualitative analysis is likely to be less flawed. One should endeavour to address and analyse competitive circumstances rather broadly. Particularly if innovation competition across producers and/or technologies can be established on a wide front (ie, beyond just isolated anecdotes), the burden should shift to the narrow market advocates to establish their case... (p691)

- 4.6 One of the points that Pleatsikas and Teece (2001) emphasise is that the enforcement agencies need to go beyond a mechanistic approach to market definition followed by a determination of market power based on market share in a market that is often too narrowly defined. Instead, they emphasise the need to take into account the full competitive environment and the constraints that it places on any alleged antitrust violation or inquiry. There are others,

particularly Salop (2000), who would advocate this approach to antitrust analysis generally, not just in industries of the new economy. He calls this broader framework of analysis the ‘first principles’ approach.

The ‘first principles’ approach to competition analysis

4.7 Salop (2000) describes the first principles approach as follows:⁹

The ‘first principles’ approach centres on an examination of the competitive effects of the conduct at issue. This is appropriate because competitive effect is the true core of antitrust. Although market power and market definition have a role in antitrust analysis, their proper roles are parts of and in reference to the primary evaluation of the alleged anti-competitive conduct and its likely market effects. They are not valued for their own sake but rather for the roles they play in an evaluation of market effects.

Market power and market definition therefore should not be analysed in a vacuum or in a threshold test divorced from the conduct and allegations about its effects. Instead market power should be measured as the power profitably to raise or maintain price above the competitive benchmark price, which is the price that would prevail in the absence of the alleged anti-competitive restraint. The competitive benchmark may be the current price, the perfectly competitive price, or some other in-between price, depending on the particular allegations of anti-competitive effect being asserted. This integrated approach to antitrust analysis is the ‘first principles’ approach.

The ‘first principles’ approach can be contrasted to one advocated by Judge (then Professor) Easterbrook, who suggested that courts should carry out a threshold analysis of market power at an early stage to use as a preliminary ‘filter’ to evaluate antitrust claims. Unfortunately, Judge Easterbrook’s threshold test approach is fraught with potential for error. It is impossible to evaluate market power accurately without understanding the conduct and effect claims at issue and analysing market power in the context of those claims. (2000, pp3,4)

4.8 We believe that the ‘first principles’ approach as described by Salop that focuses the analysis of anti-competitive conduct directly upon the alleged conduct itself and on the effects of that conduct is not only appropriate for the analysis of anti-competitive behaviour generally, but that it is particularly well

⁹ It is important to note that the ‘first principles’ approach is not a new theory of antitrust or competition policy analysis nor is it one invented by Salop. Rather it is one that sometimes has been followed by US Courts and agencies on both sides of the Atlantic. However, Salop has effectively articulated its principles and promoted its use.

suited to the analysis of alleged anti-competitive conduct in the new economy. It provides the framework and flexibility for appropriately considering competition issues in the new and old economies.

- 4.9 The statements by the authorities cited in the last section, and the literature on competition policy for dynamically competitive industries stress that competition analysis must be carried out flexibly, sensibly and not mechanically. This implies that the analysis must be adapted to the circumstances of each case. The 'first principles' approach is one that provides a general framework in which competition issues can be flexibly and sensibly analysed and that the inevitable mistakes of applying mechanistic rules to complex situations can be avoided. It may probably mean foregoing some analytical precision (often illusory) for more qualitative analysis (as Pleatsikas and Teece suggest is desirable), but this will ultimately result in better decisions.
- 4.10 Our analysis supports the view that the 'first principles' approach is consistent with the competition laws and procedures of enforcement by competition authorities on both sides of the Atlantic. This does not mean that the job of analysing competition issues in complex dynamic situations will be easy or that no modifications to the basic paradigm are required. Quite the contrary, it will often be difficult and some modifications are required but these can be made within the broader frameworks of competition analysis. Competition policy needs to deal flexibly with market definition and to use a broad definition of market power that includes both pricing power and exclusionary power. In cases where the relevant form of market power is exclusionary, one must often modify the standard paradigm to include the analysis of several markets because the exclusionary conduct frequently occurs in a market other than the one that is being protected. Further, the determination of whether exclusionary conduct has occurred is not only the central focus of the analysis but also the existence of successful exclusionary conduct also tells you that exclusionary power exists. It makes no sense in these cases to try to undertake a two step screening analysis centred first on a determination of exclusionary market power, because if the concept of market power is properly applied and a determination of market power is arrived at, the analysis is complete.
- 4.11 The reason that it is important to include exclusionary power along with pricing power in the concept of market power for the analysis of competition issues for dynamically competitive industries is that the competitive issues that generally arise involve exclusionary power rather than pricing power. In a competitive environment where competition is primarily innovation driven and based on the introduction of new products and features and only secondarily based on price, it is not surprising that most of the allegations and concerns about anti-competitive behaviour relate to actions or agreements that threaten to exclude competitors or to tilt the playing field through the adoption of an anti-competitive

strategy. Such behaviour will allow a firm or group of firms to achieve, maintain, expand, or extend a dominant position. Therefore the focus of the analysis has to be on exclusionary behaviour. If the concept of market power is to be relevant to these competition issues, it has to be broadly defined to include not only pricing power but exclusionary power. However, this is appropriate as well for analysing many cases that arise outside the new economy.

- 4.12 A good illustration of the ‘first principles’ approach is provided by the Iridium case, discussed in Part II of this report. Iridium was a satellite communications system which provided global handheld communications services. The European Commission assessed a number of agreements that were to be put in place in establishing Iridium, with a view to ascertaining whether those agreements might be considered to violate either Article 85 (1) of the EC Treaty, or Article 53 (1) of the EEA Agreement. One of the issues considered was the granting of exclusive distribution rights to gateway operators.
- 4.13 The Commission concluded that the exclusive distribution agreements did not restrict competition that would otherwise have happened. This was because exclusivity was required in order to compensate for the costs and risks associated with the functions and investment that gateway operators were required to undertake. If there was no exclusivity, the Iridium project would not have been viable as potential gateway operators would have viewed the risks as being too high.
- 4.14 In practice, the Commission’s analysis amounted to use of the ‘first principles’ approach, that reflected the competition issue at hand, and the relevant competitive constraints.
- 4.15 An example of a case in which application of the ‘first principles’ approach would have avoided significant problems is the Video Games case, discussed in Part II of this report. This case study discusses an investigation into competition in the UK video games market conducted by the Monopolies and Mergers Commission (MMC) in 1994. The MMC defined the market without considering the competitive environment the firms operated in, deduced market power from high market shares and then found a competition problem where future events have shown there was none. A ‘first principles’ approach would have avoided this problem.

Market power: pricing power and exclusionary power

- 4.16 The concept of market power is central to antitrust analysis in the US, UK, and EU. In the EU its importance arises because it is the major factor in determining whether a firm is dominant. The OFT guidelines suggest market power is the key issue and that dominance is equivalent to substantial market power (OFT

415, paragraph 2.10). The concept of market power or monopoly power, which we use synonymously, is not always used consistently by either lawyers or economists. It often appears that to say a firm has market power is synonymous with the statement that the firm has the potential to commit anti-competitive acts that could have significant adverse effects. Conversely, to say that a firm does not have market power is to say that it could not undertake anti-competitive acts that would produce significant adverse effects. This is why so much time and effort in competitive analysis has gone into establishing whether a firm does or does not have market power. However, if market power is to have this meaning then the two complementary dimensions of market power, pricing power and exclusionary power both need to be included in the definition of market power. This is particularly true as we believe exclusionary abuses may be particularly common in the new economy.

- 4.17 These two dimensions include the ability of a firm to raise price above competitive levels and the ability to engage in exclusionary conduct that raises a competitor's costs or otherwise hinders the ability of a competitor to compete or to enter the market. Clearly the concept of pricing power has dominated the literature on market power, but while less well developed, the concept of exclusionary market power has found its place in both the literature and judicial interpretation of market power or monopoly power. For example, in *United States v E.I du Pont de Nemours Co*, 351 US 377 (1956), the US Supreme Court defined monopoly power as 'the power to control prices or exclude competition.' Krattenmaker, Lande and Salop (1987) brings together these two dimensions of monopoly or market power and explores their implications for the competition analysis paradigm. It was from this analysis that Salop developed his advocacy of the 'first principles' approach because it made possible the proper analysis of competition issues where exclusionary conduct was the focus of the analysis. When exclusionary conduct is at issue, serious errors will occur if one uses a mechanistic approach to market definition and the determination of market power defined exclusively as pricing power. The proof of exclusionary power is often to demonstrate that a firm has undertaken exclusionary anti-competitive conduct that has been successful and has caused competitive harm. In such instances no separate screening process to test for market power is needed or appropriate.
- 4.18 The remainder of this discussion of market power draws heavily on the analysis by Krattenmaker, Lande, and Salop (1987) but is tailored to the problems that present themselves in analysing competition issues in the new economy. Krattenmaker, Lande and Salop (1987) state:

Our central argument is that precision in defining this central concept in antitrust law and policy could be achieved by treating monopoly power and market power as qualitatively identical, but recognising explicitly that anti-competitive power can be exercised by either of two methods: raising

one's own prices or raising competitors' costs. These two methods of exercising market power correspond, respectively, to the 'power to control price' and 'power to exclude competitors' distinction expressed in the du Pont formulation. (p28)

- 4.19 They distinguish between 'the power to control price profitably, directly by restraining one's own output', (classical or 'Stiglerian' market power), and 'exclusionary or "Bainian" market power' (1987, p248). The latter occurs where a firm can raise its rivals costs and thereby reduce their ability to compete or to exclude them from the market altogether. Krattenmaker, Lande and Salop (1987) correctly assert that:

Such allegations are at the bottom of most antitrust cases in which one firm or a group of firms is claimed to have harmed competition by foreclosing or excluding its competitors. Consumer welfare is reduced by the exercise of either Stiglerian or Bainian market power. (p248)

- 4.20 Again, the importance to this report of this line of analysis is that it emphasises exclusionary market power as a co-equal with pricing market power. It is most often the exclusionary or Bainian market power that is relevant to competition analysis in the dynamic markets of the new economy. When Evans and Schmalensee (2001) state that 'if dynamic competition is healthy, static market power is largely irrelevant for the purpose for which market power is considered in most antitrust cases particularly those involving monopolisation,' (p28) they can only be correct if they are talking about market power solely in the Stiglerian sense. Even in the short run, power to engage in exclusionary conduct can have a significant effect on how dynamic competition plays out and this is what, for example, the Microsoft case is all about. An exclusive focus on pricing power would miss the competitive issues.

- 4.21 The analysis of exclusionary market power presents some important challenges for the paradigm of defining a market and then determining market power or dominance without including it as part of the total analysis of the alleged conduct. The basic problem arises in cases where the relevant form of market power in question is the power to exclude competitors. Again, how would one prove the existence of such power in the context of an actual allegation of anti-competitive behaviour? The most direct and conclusive way to do this is to analyse the alleged conduct to determine; first whether anti-competitive conduct occurred; and second to determine whether that conduct had a significant anti-competitive impact. If the answer, to both parts of the analysis is in the affirmative, then one can conclude that the firm or firms in question had exclusionary market power and exercised it to significantly reduce competition. The very analysis that

establishes that there has been anti-competitive conduct demonstrates that the firm or firms accused of the anti-competitive conduct had the exclusionary market power to implement it effectively.

- 4.22 A firm or group of firms may have both types of market power or only one. In cases where a firm does not have pricing power, but does have exclusionary power, if a procedure is followed that defines a market and then tests for pricing power alone and finds none, serious errors can be made. This, however, does not appear to be a significant problem for competition analysis of dynamically competitive industries. In fact, in many if not most cases the firms in question have large market shares and clearly have substantial pricing power although they may not be exercising it fully. This leads to the concern expressed in earlier citations that analysts will conclude that they have substantial market power and are capable of significant competitive misconduct. From this determination, without much further analysis, it might be concluded these firms are guilty as charged. What has happened in this hypothetical example is that significant pricing power has been confused with significant exclusionary power which may not exist. It is the latter not the former which is relevant for most cases in dynamically competitive industries where exclusionary conduct is the issue. Therefore, focusing on pricing power when exclusionary power is actually what is relevant to the case can lead to serious errors. Firms guilty of exclusionary conduct may be exonerated because they have no pricing power and firms with substantial pricing power may be punished in exclusionary cases where pricing power is not the issue.
- 4.23 This is an important reason to use a definition of market power that includes both pricing power and exclusionary power. It is also an important reason for adopting the 'first principles' approach where the analysis focuses on the conduct and its consequences so we can recognise and make the appropriate adjustments for differences in how the various dimensions of market power come to play in the analysis at hand. This is critical for getting competition analysis in high tech industries right.

CONSISTENCY WITH THE CURRENT APPROACH OF COMPETITION AUTHORITIES

- 4.24 The next question is whether the broadened definition is consistent with the concept of dominance as used in the US and the EU. We see the definition of a dominant firm as one that has substantial market power in either the pricing or exclusionary dimensions, or both, as being consistent with the European Commission's concerns regarding dominance. For example, in merger cases the Commission has expressed concern about the potential for a dominant firm to engage in exclusionary conduct as well as to raise prices; specifically, the Commission's stated concern that a firm with portfolio power might engage in full line forcing or tying arrangements which represent the exercise of exclusionary

market power (Guinness/Grand Metropolitan, para. 42). Further, the power to exclude gives rise to and strengthens the power to behave to an appreciable extent independently of competitors, customers and consumers. Thus, a concept of dominance based on a broader definition of market power is of enhanced usefulness in competition analysis just as is the broader definition of market power itself.

- 4.25 This framework for analysing market power which includes both pricing power and exclusionary power is useful for defining and discussing anti-competitive acts or conduct. Again, we follow and develop a line of argument put forth by Krattenmaker, Lande, and Salop (1987, pp260-262) where they discuss US legal standards governing the acquisition and exercise of market power. In the US, if a single firm achieves either pricing power or exclusionary power by accident, government grant, or by superior skill, foresight and industry, it has acquired that power lawfully. Further, a firm that has so acquired pricing power can legally raise its price and restrict its own output in the market. Therefore, the exercise of legally acquired pricing power by a single firm is not condemned as anti-competitive. On the other hand collusion among firms to acquire and/or exercise pricing power is considered anti-competitive except in particular cases where there are offsetting efficiencies or other pro-competitive effects. Mergers, for example, which may increase pricing power may not be challenged as being anti-competitive if they bring large efficiencies in terms of cost savings.
- 4.26 Exclusionary power or Bainian power on the other hand is different in the US Even if acquired legally by a single firm, that firm does not have an absolute right to use it. In fact Krattenmaker, Lande, and Salop (1987) state:
- It is unclear under current law whether the exercise of Bainian power is even permitted (footnote omitted). If it is, a firm lawfully may exercise Bainian power only if the resulting power over price is more than offset by gains in efficiency. (p261)
- 4.27 If we generalise this concept we see that the use of exclusionary market power is always anti-competitive, again unless the anti-competitive effects are more than offset by efficiency gains or other pro-competitive benefits.
- 4.28 Therefore, in the US anti-competitive conduct is any collusive conduct among firms to obtain and exercise pricing power and any exercise of exclusionary power by a single firm or by collusion among firms. The only exceptions in both cases are where the potential anti-competitive effects are more than offset by efficiency or other pro-competitive benefits or where the effects are so minimal that they are not significant.

- 4.29 The situation in the UK and EU is slightly different. Here a dominant firm or monopolist cannot exploit pricing power even if legally acquired. Hence the concept of anti-competitive conduct is even simpler. Anti-competitive conduct becomes any attempt to gain and/or exercise market power (broadly defined) by a dominant firm or a collection of firms. The only exceptions are in some cases where the anti-competitive effects are more than offset by efficiency or other pro-competitive benefits or where the anti-competitive effects are insignificant.¹⁰ Therefore, all anti-competitive conduct is associated with the exercise of market power. Whether or not it is condemned as anti-competitive by the competition authorities will depend on how significant the anti-competitive impact might be and whether there are offsetting efficiencies or other pro-competitive benefits. Note that if the concept of market power does not include exclusionary power as well as pricing power, this correspondence between market power and anti-competitive conduct does not hold.
- 4.30 As much of the rest of this report demonstrates, competition policy in the new economy is largely about identifying, measuring, and weighing the potential anti-competitive effects of primarily exclusionary conduct against the potential productive benefits to determine what is anti-competitive and what is not under the law. The need for this exercise in considering competition issues in the new economy results from the fact that many practices that have often been condemned as anti-competitive may not be under circumstances in the new economy. Tying and price discrimination are two examples. Further, competition authorities need to consider many new forms of exclusionary conduct, strategies, and new forms of proposed collective action and decide whether these situations are, on balance, anti-competitive. A broad definition of market power that encompasses both pricing power and exclusionary power is a useful starting point for determining what is and is not anti-competitive.

TWO EXAMPLES SHOWING WHERE ERRORS CAN BE MADE

- 4.31 Two hypothetical cases will illustrate the types of errors that can be made if one does not include and distinguish between pricing power and exclusionary power in the concept of market power. The fact patterns in these two hypothetical cases are based upon two real cases but have been sufficiently altered so that the basic points can be illustrated more simply and without a full-blown description of the cases in point. The fact patterns have also been altered enough to make them truly hypothetical.

¹⁰ This is consistent with Article 81.

4.32 Consider first the case that is most relevant to dynamically competitive markets. In this case a firm has significant pricing power in one market and is accused of exclusionary conduct designed to leverage its dominant position into a second market. The question is: does this firm have the exclusionary power to do so and did it in fact achieve its goal?

4.33 In this case the firm accused of anti-competitive conduct is a firm that makes the software platform for trading bonds among firms electronically. While there are several other platforms that perform this function, 80 per cent of the bond traders use the system and 80 per cent of the transaction volumes are traded on the system. By all tests, this trading platform has pricing power, although in an effort to expand its market share and to obtain network benefits for its customers, it has priced below short-term monopoly levels. There is no question that it could raise prices 10 to 20 per cent and increase its short-term profits substantially.

Further, each bond trader accesses and uses the trading platform with application software that provides a variety of functions in addition to exercising the trade – such as, backroom accounting, customer billing, taxes, and other functions. There are ten companies producing this software, including the platform manufacturer itself, which has 40 per cent of the application software market, with two firms at 20 per cent and the remaining firms with the remaining 20 per cent. The platform has established and published a set of parameters which application software writers need to know in order to access the platform. This access has been accomplished effectively by a number of the application companies who, in fact, will licence their software used to interface with the platform to other software developers who specialise in other back office functions but who want to connect their software capability to the platform.

4.34 A new firm wishes to enter the applications market and wants neither to write its own interface software nor to licence the interface software of other applications vendors, which is available. It goes to the platform manufacturer and demands a licence on the interface software that the former uses on its proprietary applications software. When the platform producer refuses, the potential entrant complains to the competition authorities that this is an abuse of a dominant position in the platform market.

4.35 Clearly, the platform maker has pricing power and is dominant in the platform market. It has 40 per cent of the applications market and, for the purpose of argument, we assume it has some limited pricing power in the market for applications software. However, that fact is irrelevant to the charge in this case, which revolves around unreasonable and anti-competitive exclusion. Note, firms have been able to enter the market and effectively write their own interface

software. In addition, such software can be licensed from some of the other vendors, so the potential entrant has a number of reasonable options other than licensing access software from the company that manufactures the platform.

- 4.36 The point here is that this is in no way a question of exercising pricing power. Rather, it is an issue of exclusion, and in this case there seem to be many options open to the potential entrant that make mandatory licensing by the platform manufacturer inappropriate. Indeed, by itself the platform manufacturer does not have the power to exclude the potential entrant. One might want to raise further questions in this case, but none of them would relate to pricing power; all would relate to potential exclusion. What concerns the commentators cited earlier is that we will find that the platform company has significant market power as measured by pricing power and is assumed to be guilty of anti-competitive conduct, whereas the real issue in this case is the power to exclude, which the platform company in this hypothetical example does not have.
- 4.37 The second hypothetical case is where a firm does not have pricing power, but does have and use exclusionary power. Consider the market for houses in the US. People wishing to sell homes typically list their homes with an estate agent, which in this case is a firm with many sales people. This listing is then put onto an area-wide list called the Multiple Listing Service (MLS), and any individual firm can sell off this list. For purposes of this example, we assume that when a sale is made, the seller's agent (the one originally listing the property) and the buyer's agent split a fixed commission of seven per cent, a portion of which is paid to the salespersons actually making the sale. This is a standard voluntary practice among estate agents.
- 4.38 There are 1,000 estate agent firms in this hypothetical market, entry is extremely easy, and there are a few larger firms. In addition, in this hypothetical market there is one firm with 40 per cent of the market, two with 10 per cent, and the remaining firms make up the competitive 'fringe.' Under these circumstances, even the firm with 40 per cent has no pricing power.
- 4.39 Now a new firm enters the market. This new firm uses a different business model. Instead of hiring sales people, paying them a part of the firm's commission on a sale, and providing them with an office and support, it gives the full sales commission to the salesperson. The salesperson, in turn, pays a flat fee per month for the use of the firm's office facilities and support. This new firm also gives the salesperson the power to negotiate commission rates and to arrange for advertising. The new firm has been successful in this strategy in many other markets where it has recruited the top sales people from other firms, set them up for a support fee, and allowed them to keep their commissions earned.

- 4.40 In this case the firm with 40 per cent of the market decides to try to block the new entrant and unilaterally initiates a price discrimination scheme to achieve this. It cuts the percentage of the commission it will pay to the new firm on properties sold from its listings on the MLS from 50 per cent to 25 per cent. For everyone else, the split remains 50 per cent/50 per cent. Because the firm has 40 per cent of the listings on the MLS, this dramatically changes the incentives to the sellers at the new entrant and makes it impossible for them to recruit sales people. The result is that the new entrant fails.
- 4.41 In this case, the estate agent with 40 per cent of the MLS listings did not have pricing power, but did have the power to engage in an exclusionary scheme to prevent the entry of a potentially dangerous competitor with an innovative business model. If one had gone through a screening process based upon market power in the sense of pricing power alone, this complaint would have been dismissed. This would have been an error. The conduct was clearly designed to be anti-competitive and it had an anti-competitive effect. This also illustrates the fact that the way one often proves that exclusionary power exists is to prove that such power was used effectively to lessen competition.
- 4.42 This is an example that demonstrates that the standard paradigm of market definition, market power and hence potential for abusing a dominant position can lead to incorrect results. A standard market definition-market power analysis would have led to the case being dropped when in reality a firm with exclusionary power was acting anti-competitively. This neatly illustrates why we prefer the 'first principles' approach.

Market definition

THE ROLE OF MARKET DEFINITION IN NEW ECONOMY CASES

- 4.43 Market definition is an integral part of every antitrust case. While market definition is often a useful tool for organising the information to be studied in a competitive analysis, too often it becomes an end in itself. When that happens it ceases to be a useful tool and becomes a serious source of potential error in competition analysis. To understand how to make market definition a useful tool requires an analysis of the purposes of market definition in the context of a specific competition analysis, not just of applying the rules for market definition. This is one of the fundamental tenets of the 'first principles' approach and one of the reasons we advocate it for analysing competition issues in the new economy where we may have to analyse effects that take place in a number of different markets or in markets that do not yet exist. The Microsoft case, discussed in Part II of this report, illustrates a number of these points. The market that Microsoft was allegedly trying to protect was the market for its Windows

operating system for the PC; its alleged anti-competitive acts were directed at Netscape's internet browser and Sun's Java. Fisher (2001) explains the reasons for Microsoft's actions as follows:

These can both be described as innovations which had they become very widely used, would have weakened or destroyed the applications barrier to entry. They would have done so not by themselves competing as operating systems but by encouraging software applications writers to write for the browser or for Java rather than for the underlying operating system. Since the browser and Java would run on non-Windows operating systems as well as on Windows (indeed that was the whole point of Java), Microsoft feared that the operating system would become 'commoditised,' ie, that operating systems would have to compete only on their underlying capabilities. It therefore set out to ensure that this would not happen. (pp9,10)

4.44 Fisher also states when discussing the issue of market definition in connection with the Microsoft case:

...I believe that market definition here was an unnecessary analytic step, as it usually is, despite the legal requirement. (p8)

In the Microsoft case¹¹, it was alleged that Microsoft attempted to protect a dominant position in one market by undertaking exclusionary behaviour against Sun Microsystems and Netscape to cripple the growth of two innovations that were certainly complimentary to operating systems and which, by any traditional definition of markets were in different markets. Therefore, any attempt to restrict the analysis of Microsoft's alleged anti-competitive behaviour to the confines of some traditionally defined market would at best be counterproductive and at worst would lead to serious mistakes. It should not be surprising, in a world of dynamic and sometimes winner-take-all competition where the next generation of product or technology can come from a wide variety of sources, that a firm with a dominant position in one market, such as Microsoft, would be looking for potential competition from firms outside its own market. It is also not surprising that in an effort to protect or extend a monopoly a dominant firm might engage in exclusionary behaviour designed to thwart or defeat products that might pose a threat even if they do not currently appear to be close substitutes. Therefore, competition analysis will often have to look beyond a single market traditionally defined if it is to deal with the complexity of competition issues that arise in the new economy.

¹¹ For a more detailed description of the Microsoft case, see the case study in Part II.

- 4.45 Similarly, the concept of innovation markets, which has been substantially criticised, was developed to deal with the analysis of competition issues pertaining to mergers and licensing issues where no market for goods and services exists. This approach maintains the market definition paradigm, but does it really facilitate intelligent analysis of the competitive issues at hand? We address innovation markets as a separate topic in Annexe B. The basic conclusions are that it is better to analyse competition and potential competition in product markets whenever possible. Where product markets cannot be defined because it is not clear what products will emerge, perhaps the use of the concept of an innovation market can be justified. However one should also ask whether defining such a market is useful to the analysis of the competitive issues involved or is simply a distraction necessary to 'shoe horn' the analysis into the standard paradigm and to meet legal requirements.
- 4.46 However useful or necessary market definition is in a particular case, it is a legal necessity in many situations and certainly an established part of competition analysis. Also there are accepted procedures for defining product and geographic markets. For the purposes of this report it is important to review and analyse the standard procedures for market definition as they pertain to the analysis of the dynamically competitive industries of the new economy.
- 4.47 Market definition is used primarily for two purposes, the computation of market shares and the computation of concentration statistics such as the HHI. A large market share has traditionally been associated with market power defined as pricing power and high concentration ratios with the potential for tacit or explicit collusion. In addition, market definition provides the framework for discussions of competitive constraints such as ease of entry and potential competition.
- 4.48 The concept of a market with both product and geographic dimensions has been central to modern competition analysis although as Fisher (2001) points out, competition analysis is the only arena in which economists actually define product and geographic markets in the process of reaching economic conclusions. Markets are a part of the economic environment in which competition takes place and based on economic conditions in that environment, firms will make production and pricing decisions. From the standpoint of determining the product dimensions of the market for competition analysis one seeks to include those products which, because of their substitutability on the demand side or supply side, act as a constraint on the pricing and production decisions of the firm or firms whose conduct is being analysed. From a geographic perspective one seeks to include the geographic area where the production of products that are defined to be in the product market will because of their geographic location, provide significant competitive constraints on the behaviour of the firm or firms under consideration. Much of the economic analysis of competition policy in the past and today has focused on market definition.

- 4.49 While the history of market definition in competition analysis is beyond the scope of this paper, it is worth noting in earlier analyses of market definition there was often debate about the substitutability on both the demand and supply side of various products and of how important these effects were for constraining the behaviour including pricing and output decisions of the firm or firms whose conduct was being analysed. Ultimately, how the market was defined was a subjective decision that was made by the finder of fact based on the evidence presented.
- 4.50 Often, for reasons that are well known, market definition was the heart of the analysis with the decision on market definition driving an evaluator's entire decision regarding the alleged anti-competitive behaviour. Frequently, it was the critical determinant not only of whether the alleged abuses were considered anti-competitive but of whether the conduct and its effects were even considered worthy of analysis. If markets were defined broadly enough and market share or concentration ratios were low, examiners assumed that there was unlikely to be a significant competitive issue and the case was dropped without further analysis of the alleged conduct or its effects. It is therefore not surprising that much of the subsequent effort by economists regarding market definition focused on trying to provide a rigorous methodology for defining product and geographic markets that would eliminate some or most of its subjectivity.

USING THE SSNIP TEST IN NEW ECONOMY CASES

- 4.51 When the well known SSNIP procedure was proposed, there was general agreement among antitrust economists that this concept was a significant step forward and it has been widely accepted by antitrust and competition authorities in the US and EU. We will assume for the purpose of this report that the readers understand the SSNIP procedure approach to market definition. For any reader wishing to know more about market definition, we refer them to other reports prepared for the OFT (OFT, 1993 and 2001).
- 4.52 The SSNIP procedure focuses the definition of both the product and geographic markets upon the following question: Would this group of products produced in some defined geographical area be worth monopolising? Put differently, could a hypothetical monopolist producing these products in a given geographical area profitably introduce a small but significant non-transitory increase in price. If the answer is yes, then this group of products in the specific geographic area constitutes a combined product and geographic market, because it contains the competitors and their products that possibly could have constrained such an increase by making it unprofitable. Small but significant, for antitrust purposes, is often taken to be a price rise of five to 10 per cent. Clearly the SSNIP procedure is designed to create a market definition tailored to identifying pricing power.

- 4.53 The SSNIP procedure is a conceptual tool for helping think about how rigorously to define a market and can also be the basis for developing empirical data to support the use of a particular choice of a product or geographic market definition. It is important to note several points. First, the SSNIP procedure does not necessarily lead to a unique product or geographic market definition. It does not necessarily include in the market all significant sources of present or future competition for the firm or firms in question. This is particularly the case in dynamically competitive markets. What it does do is include in the product and geographic market those products and the firms producing them that might have prevented a small, immediate but significant rise in price, say five to ten per cent, from being profitable. However, it is a market definition that is totally focused on short term static price competition within the existing competitive environment, ie, given the existing price structure, technology, cost structure, and geographic market structure.
- 4.54 Next turn to market definition in the highly dynamic markets of the new economy. There is a fallacy or trap which we will call the 'dynamic pricing' fallacy which in many ways is the opposite of the well-known Cellophane fallacy. The Cellophane fallacy arises because a firm with monopoly power prices so as to maximise its short run profits. As a result, it appears that many more products are in the market to constrain the monopolist at the current price than if the SSNIP procedure were performed using a base price which might be considered a competitive price.
- 4.55 The 'dynamic pricing' fallacy is the opposite of this in the following way. Consider a firm with a product in a market where there is rapidly changing technology; where there are network effects and gaining a large market share and a large installed base of users is important; and where the threat of new entrants is very real. This firm may well price its product substantially below what it could charge if it were attempting to maximise profits in the short run rather than the long run. In other words, it is pricing below the price that would maximise short run profits. This is a situation believed to occur frequently in the industries of the new economy where network effects are significant. In some cases we see firms giving away their products. An example of this can be found in the Microsoft case where the Department of Justice presented evidence that Microsoft referred to its Internet Explorer browser as a 'no revenue' product. This is discussed further in Part II of this report.
- 4.56 However, even where firms are earning substantial profits, it often appears that many firms are not fully exploiting their short term pricing power. What this suggests is that if one applied the SSNIP procedure using the current price as is typical in competition cases, one might find in many cases that the relevant product market would be as narrow as the product of the firm in question.

- 4.57 Consider the case of alternative computer game platforms such as Sony or Nintendo. Each company's console has its own set of games. The companies compete against one another on the basis of alternative systems. Now consider the problem of defining a market in this industry for a monopolisation or merger case. It might well be the case that if you applied the appropriate SSNIP procedure for market definition based on the current price, one might find that there was a separate market for each platform simply because each of these gaming platforms was being priced more than 10 per cent below the price that would maximise their short run profits in order to maximise the size of the installed base to sell games to. This pricing phenomenon will mean that in general markets defined using the SSNIP procedure and the current price will result in a market definition too narrow for the purpose of analysing competition issues in this industry. For example, for a monopolisation analysis, a mechanistic use of this procedure for market definition might show that each firm producing a computer game platform has a total monopoly in separate markets defined by their products. For merger analysis, these firms would be in separate markets which might lead to the unthinking and unwarranted conclusion that merging several firms would have no effect on competition. This is a clear example of how rigid market definition rules can fail to produce intelligent and sensible analysis and where flexibility and common sense are of critical importance.
- 4.58 Furthermore, the SSNIP procedure for market definition is focused on 'small' price changes whereas competition in new economy markets focuses much more on product features that have proven to be of enormous value to consumers. These differences in features or functionality are often of such value that they totally dominate small changes in prices. Furthermore, many anti-competitive actions are not designed to increase the short-term price but rather to affect future competition, which in turn will affect future prices and future product configurations. For these reasons and those stated earlier we believe that the analysis of competition issues in the dynamic industries of the new economy cannot be based on a mechanistic procedure that begins with defining a relevant product and geographic market using any single rule for market definition, and then proceeds to analyse market share and determine dominance or market power before even considering the alleged anti-competitive abuse that is at issue.
- 4.59 It should be the other way round. One needs to look at the alleged abuse or the competition issue and ask how market definition and the analysis of competitive constraints in the market can help us understand the issue at hand. It is this guidance that the 'first principles' approach gives to competition analysts. It does not tell us how to define the market; that has to be based on analysis of the specific situation being analysed.

Consumer harm and economic efficiency

- 4.60 When looking at the effects of anti-competitive behaviour one ultimately must focus on the critical concepts of consumer harm and economic welfare. Here again the analysis of competition enforcement in the new economy raises some new dimensions. Competition analysis has typically focused on higher prices and restricted output as the source of consumer harm. In many high-tech industries of the new economy we observe the introduction of new superior products, and in general we see falling prices. Some commentators have raised the question: How then can there be significant anti-competitive behaviour that is causing or will cause significant consumer harm when prices are falling?
- 4.61 This apparent paradox arises because of the nature of consumer harm and the timing of this harm when anti-competitive acts distort the dynamic competitive process by stifling innovation and distorting the introduction of new products and services. Thus, because of anti-competitive acts, the economy of the future will be different in the technology that it uses, the products that are available, and the prices that are charged than if these anti-competitive acts not occurred. The fact that the future course of the economy will be different if anti-competitive behaviour distorts the competitive process from what it would have been had competition been allowed to occur is the cause of consumer harm in these cases. These changes will occur in the future and be very hard to measure because of the difficulty of predicting what the trajectory of the economy will be with and without the anti-competitive acts.
- 4.62 What then would be the consumer harm? How do we know that harm would exist? How would we measure it? Put differently, how would we know, even if we had perfect powers of projection, whether the technologies, products, and prices in place without distortion by anti-competitive acts are better from the point of view of economic welfare than those with such distortions? There is no economic theorem that gives us the answers or that demonstrates that one economic state is better than the other. Our conclusion that there would be harm and a reduction of economic welfare if competition is distorted by anti-competitive acts is based on the informed belief that a world in which competition is based on the development of new, better and cheaper products and which is devoid of anti-competitive behaviour designed to harm the productive efforts of other competitors, will result in a better outcome for consumer welfare generally. This appears to us and, we would assume, to the many authorities that support competition policy in the new economy as well, to be a highly tenable assumption on which to base competition policy in dynamic industries.
- 4.63 Is this different or somehow less defensible than our belief that competition policy enforcement will improve economic welfare in the smoke stack industries of the old economy where the primary objective is preventing the restriction of

output or the raising of price above so called competitive levels. The answer is no. There is no economic theorem that tells us that economic welfare will be enhanced if competition policy is enforced in these situations either. What we do know is that rivalry forces competitors to reduce costs, thereby promoting what economists call x-efficiency, that rivalry forces firms to reduce prices which benefits consumers, and that it provides an incentive to innovate, which also benefits consumers. These are all conditions that make competition and a competition policy that seeks to maintain openness and the absence of what we know as anti-competitive behaviour a good thing for the old economy, and good for the new economy as well.

4.64 Economists sometimes use the model of perfect competition and the fact that it produces efficiency in the Pareto sense as an ideal or model to be emulated. Much of applied microeconomics begins with assuming equilibrium in a perfectly competitive economy and then analyses what happens to economic welfare, measured in terms of dead weight losses, to show the cost of monopoly or anti-competitive behaviour. As an illustrative tool it is very useful. However, we should be very clear about the shortcomings of this analysis when basing welfare conclusions upon it.

- First, it assumes as a starting point a perfectly competitive equilibrium where prices equal marginal costs. This does not even approximately represent the economy in which we live and work. There are major distortions, taxes being one of the largest, that are well understood by economists. Accordingly, in the real world, all of the conditions for Pareto optimality are violated.
- In such a situation, it is also well understood from the theory of the second best that when there are distortions throughout the economy, then it is not optimal to follow the rules for Pareto optimality associated with perfect competition in any one market (Davis and Winston, 1965).
- The implication of this is that the dead weight losses we typically measure, while illustrative, are inaccurate – perhaps very inaccurate. This does not mean, however, that economics does not have important things to say about economic efficiency and consumer welfare. It does, although it has more to say about static efficiency than dynamic efficiency. But, while economics is informative, ultimately our conclusions about competition policy as it relates to economic welfare are informed judgements.

4.65 The point of this digression is that competition policy is not and cannot be based on formal theorems from economics about efficiency. Rather, it is based on the presumption that a competitive process characterised by rivalry and rules that prevent competitors from engaging in actions that exclude or prevent others from competing as effectively as they could if this interference had not occurred,

will produce a higher level of economic welfare than the alternative. This is true for the old economy and for the new economy. The fact that the harm to consumers often comes further in the future and is more difficult to predict and measure in case of anti-competitive behaviour in the new economy does not mean we should believe that it is less real or less serious. In fact in a Schumpeterian world where innovation is the driving force, anti-competitive acts, which make future innovation more difficult and which lower the reward to innovation and make it more uncertain, attack the heart of the engine of competition.

- 4.66 This means that where there have been significant anti-competitive acts, there is likely to be significant harm. Because of the difficulty of being able to specify the effects well into the future, it may be difficult to demonstrate and quantify harm. One of the critical issues that all competition agencies face is deciding what is the appropriate standard of proof of appreciable harm in competition cases involving industries of the new economy. In many cases it may be appropriate to assume appreciable harm when significant anti-competitive acts have occurred, but where consumer harm is hard to measure.

The ‘first principles’ approach: ‘*per se*’ rule v the rule of reason

- 4.67 The reason many economists, such as the ones quoted earlier, are concerned about applying to the new economy the standard paradigm of defining a market and then determining whether a firm has market power or is dominant is that they believe, correctly, that the standard paradigm may define a market too narrowly to reflect all of the competitive constraints upon the firm in question. In addition, because the leading firm in many new economy industries will have a large market share and unquestionably have static market power in a strict economic sense, dominance may be found in many cases.

- 4.68 What problems does this create?

- (1) Some would argue that this process does not screen out as many cases as it should and that the competition authorities and the courts will be swamped with cases and will not be able to handle them. This is an empirical question and, at least from the evidence we have seen, there does not appear to be a major problem.
- (2) The second, and more fundamental problem, is the belief that once the determination of market power or dominance has been made, the analysis of the competitive situation, of the incentives of the parties, of the competitive constraints on the behaviour of the firm accused, and of the competitive effects and consumer harm essentially stops or is truncated, and that anti-competitive behaviour and appreciable anti-competitive effects will be found without sufficient analysis to justify such findings. A consequence of this

will be that the competition authorities will intervene too often in new economy industries either because they perceive such industries are prone to competitive breakdowns leading to entrenched monopoly power or in response to complaints from competitors which may or may not have merit.

4.69 As we understand the 'first principles' approach, it would focus the analysis from the beginning upon the alleged anti-competitive conduct. It would then use the definition and analysis of markets, market power (both pricing and exclusionary), and competitive constraints broadly defined to determine whether the alleged anti-competitive behaviour did have anti-competitive effects and whether these effects caused significant consumer harm. This would allow for the broader analysis of competitive constraints that Evans and Schmalensee (2001) and Pleatsikas and Teece (2001) would like to see, including the presentation of evidence of the Schumpeterian nature of competition. It would also allow for explicit analysis of whether a particular firm had the ability, power, or incentive to carry out the alleged anti-competitive act. This would include the analysis of whether there was intent to commit anti-competitive acts, whether in fact anti-competitive acts were committed and whether those acts had the intended anti-competitive effects. Further, one could analyse explicitly what the effect would be upon innovation, short-term competition, long-term competition, price in the short- and long-run, and upon product diversity and quality. In other words, one would have a fully developed rule of reason analysis expressly focusing upon the alleged conduct and its effects.

4.70 However, Evans and Schmalensee (2001), for example worry that:

Many business practices are suspect under the antitrust laws only if the firms engaging in them have significant market power. Business practices such as tying the sale of two or more products, entering into exclusive distribution contracts, selling products below cost, acquiring other firms, and engaging in price discrimination are not questioned for firms without market power. But for firms with market power, these same practices are either 'per se' illegal under the antitrust laws (eg, tying under some conditions) regardless of its economic effects, or subject to a more extensive rule of reason inquiry (eg, selling products below cost) into economic effects. The inquiry into market power is therefore central to many antitrust cases. (p18) (References in original omitted.)

4.71 At first it seems that they are simply concerned with the fact that in some cases the full 'first principles' approach cannot be used because of the way the law has been structured, a concern we share in some instances, eg, price discrimination. However, Evans and Schmalensee (2001) go on to object to the fact that in other cases the problem is that a full rule of reason enquiry will be undertaken. The latter suggests that they have grave concerns that even given a full analysis,

the competition authorities and the courts will get the analysis wrong and that therefore we need a way of keeping more cases out of the hands of the competition authorities. We have some of the same concerns. We have all seen cases where we believe mistakes may have been made. Competition analysis in complex dynamic circumstances is difficult at best, and one would expect some mistakes, especially in the early stages. However, not to address competition issues in dynamically competitive industries is equivalent to exempting them from antitrust enforcement. That approach has been overwhelmingly rejected. The solution is to perform the analysis that drives the enforcement correctly.

- 4.72 Consider the first problem that Evans and Schmalensee (2001) raise, namely that there are certain offences that are illegal if there is a finding of market power or dominance. Then the question is whether or not there are characteristics of industries in the new economy that would justify changing the '*per se*' rule and requiring further analysis before concluding that this conduct should be declared illegal. For example, Evans and Schmalensee (2001) state that, 'fixing prices or preventing competitors from distributing their products generally will harm consumers even if dynamic competition is vigorous'. (p1)
- 4.73 Evans and Schmalensee acknowledge the fact that vigorous dynamic competition does not eliminate the need for competition laws and their enforcement. Presumably, they have no problem with price fixing being '*per se*' illegal. One competitive issue where they do have a problem is with the law on tying in the context of high tech product integration. Even here however they believe that The Fifth Circuit Court in *Leasco* was moving in the right direction. They state, 'since *Leasco*, a number of other technological tying cases have established the courts reluctance to intervene in product innovation discussions. The Second Circuit Court in *Foumst*, for instance, held explicitly that the *per se* rule is inapplicable to technological ties.' (2001, p40). They should be even more reassured that the US Court of Appeals for the district of Columbia ruled that the tying issue in the *Microsoft* case was remanded to the trial court to be pursued under a rule of reason analysis.
- 4.74 This is a case where, at least in the United States, the dynamic interpretation of antitrust is keeping up with the new situations that arise. The issue of product integration and tying is not an issue that is unique to high technology industries although it may arise more frequently in high technology industries. It is a difficult issue that antitrust authorities have had to grapple with in the past and will have to grapple with in the future. However, what better environment to tackle these tough issues than within the framework of 'first principles.' One would not wish these cases decided on technical issues of market definition or market power without considering the total context of the case.

- 4.75 Another areas where we believe that a rule of reason should be used is the vexed area of price discrimination. Price discrimination from an economic point of view can sometimes be efficiency enhancing and in some instances necessary for a product's production and sale. In other cases it can be used as an anti-competitive device to exclude competitors and harm competition. For this reason we believe that whether it should be declared anti-competitive should be determined by on a case by case analysis of the facts. It is true that the cost structure and nature of new economy industries and markets makes price discrimination particularly important, but our opinion about this area of competition law is the same for the old economy and the new economy.
- 4.76 Evans and Schmalensee (2001) do not like the analysis of predation that prevailed in the Microsoft case and come very close to advocating that we should adopt a policy that would make showing that a market or industry is dynamically competitive a blanket defence against charges of predation (p45). Their basic concern again seems to be not that a rule of reason analysis is not appropriate for considering this issue, but that the competition authorities and the courts will make mistakes, and find predation where they should not and by so doing will chill the competitive vigour in new economy industries. We agree that mistakes can be made, but predation can be a powerful tool for protecting and extending a dominant position particularly in the dynamic industries of the new economy.
- 4.77 We disagree with their suggestion for a *per se* blanket defence because the complexity of the products and systems and the interdependencies among them and among the firms in related sets of industries in the new economy increases the potential for predation and makes it a serious issue for concern. While we would agree with Schmalensee and Evans (2001) that isolated statements about wiping out the competition are probably not conclusive evidence of intent, we do believe that evidence of intent is important particularly when it is in the form of a well articulated plan that is implemented and that produces the desired consequences. Intent can be exceedingly helpful in distinguishing between predatory or other exclusionary behaviour and just another business decision, just as can observing what a firm did and what its effects were.
- 4.78 Now return to the 'first principles' methodology which Salop distinguished from the screening approach advocated by Easterbrook (1981). We would argue that while we see many benefits from the 'first principles' approach of analysing the alleged conduct and its competitive effects directly, we believe there is a real benefit from having a screen to make sure that we do not waste time and resources analysing situations and issues where there is a very low probability that alleged anti-competitive conduct could have a significant anti-competitive effect. Therefore, if a firm (or combination of firms) does not have a significant

market share in some narrowly-defined market, its behaviour probably should not be of concern to the competition authorities. There may be some exceptions to this, but as a general rule this is true. Salop would agree with this as long as it is a minimal market share test. Therefore, we believe that having a market share screening test is a good idea and should not be abandoned, but that it should be nothing more than a minimal screen.

- 4.79 What we propose is that some market share screen be retained as part of the 'first principles' approach. This is consistent with practices used now by the competition authorities in the UK, EU, and US. Note that the proposed test has to hold for the narrowest plausible market definition. If it does, then no further investigation should in general be undertaken. This is consistent with the approach suggested by NERA in their recent report for the OFT on market definition in dominance cases (OFT, 2001). What is considered an appropriate screen would be left to the determination of the competition authorities.
- 4.80 Under this proposal, cases passing this screen would go forward on a 'first principles' basis with the analysis focused on the alleged conduct and its effects. The competitive limitations including those created by the forces of dynamic, Schumpeterian competition could all be brought to bear on the issue of whether the conduct in question was anti-competitive and caused appreciable harm. This approach would work equally well for the analysis of competition in the new economy and the old economy. It is particularly well suited to addressing the complexities of analysing competition problems in the new economy because of the flexibility to bring in all the evidence that is relevant to determining the competitive effects in cases that involve exclusionary anti-competitive behaviour. It would also be consistent with the current processes of competition analysis in the US and EU. The one possible modification would be that most of the hard analysis would occur after the initial screening and would focus on the alleged anti-competitive conduct, on how it would produce anti-competitive effects, and on what those effects would be.
- 4.81 For example, if one looks at the guidance given on market definition, and market power, and the definition of dominant market position in the UK, one finds nothing that would prevent these concepts from being defined within the 'first principles' framework of competitive analysis.
- 4.82 The OFT¹² states that market definition is important and that the appreciability test under Chapter I must be applied within the defined market. It also notes that firms with very low market shares are unlikely to be dominant and that while 'high market shares are not themselves prohibited, and do not necessarily

¹² OFT 403, *Market Definition*, March 1999

indicate a competition problem,' market shares are measured primarily as a screen to filter out cases where no market power is present. This is totally consistent with the proposed 'first principles' approach with a minimal market share screen defined by the OFT.

4.83 The OFT's publication *Assessment of Market Power*¹³ states:

...The Director General takes the view that an agreement will generally have no appreciable affect on competition if the parties' combined market share of the relevant market does not exceed 25 per cent, although there will be circumstances in which this is not the case... (p4)

4.84 This threshold is based on a market share test, but it is specifically noted that there may be exceptions. Presumably, the exceptions will be based on an analysis of the competitive circumstances that might justify modifying the rule in particular cases. The approach we propose is designed to allow that kind of analysis of exceptions to be incorporated. The OFT also states, in the same publication that:

...The Director General considers whether and the extent to which an undertaking faces constraints on its ability to behave independently. Those constraints might be existing competitors, potential competitors and other factors such as strong buyer power from the undertaking's customers (which may include distributors, processors and commercial users)... (p5)

4.85 We also believe the European Commission's analysis and decision making in the Iridium¹⁴ and British Interactive Broadcasting¹⁵ cases were very much in the spirit of the first principles approach to the analysis of competition issues. In particular the Commission took a flexible approach to market definition and was able to analyse a complex set of issues in each case to reach what we consider to be essentially the correct decision. These cases are discussed in some detail in Part II.

4.86 Further, when it comes to mergers, the 'first principles' approach is consistent with either the standard of dominance or the standard of a substantial lessening of competition. If the analysis is done properly under either standard, the results should be the same. The determination of dominance based on a broad definition of market power as previously discussed is a determination that the

¹³ OFT 415, *Assessment of Market Power*, September 1999

¹⁴ 97/39/EC: Commission Decision of 18 December 1996 relating to a proceeding under Article 85 of the EC Treaty and Article 53 of the EEA Agreement (Case IV/35.518 – Iridium)

¹⁵ 1999/781/EC: Commission Decision of 15 September 1999 relating to a proceeding under Article 81 of the EC Treaty (Case IV/36.539 – British Interactive Broadcasting/Open)

firm could undertake anti-competitive acts. Whether that is reasonably likely and whether the competitive effects will be substantial requires further analysis. This suggests that while there is no inconsistency in the two approaches, the true objective of the analysis is to determine whether there would be a substantial lessening of competition. Thus, the 'first principles' approach would suggest that it is better to focus the standard on the ultimate objective which in this case is to determine whether there would be a substantial lessening of competition.

Conclusions

- 4.87 In this chapter we have argued for using the 'first principles' approach to competition policy issues in dynamic markets. This approach focuses attention on an examination of the competitive effects of the conduct in question and highlights the fact that market definition and findings of dominance should not be the main focus. In addition, we have argued that if the concept of market power is to be useful in competition policy analysis in dynamic markets, then it must include the concept of exclusionary power as well as pricing power. Finally, we noted that the logic of our arguments implies that '*per se*' rules should play virtually no role in competition policy in dynamic industries except in price fixing cases.
- 4.88 The remaining chapters of this report address the specifics of how characteristics of the new economy affect the analysis of various antitrust issues. This analysis is not dependent upon the adoption of the 'first principles' paradigm but does support the case for it. This analysis also illustrates some of the dangers of fixed rules and the need for flexibility, which almost everyone agrees, is important.

5 UNILATERAL BEHAVIOUR

- 5.1 We now address three broad areas of concern for competition authorities resulting from the unilateral action of a dominant firm that are of particular importance for dynamically competitive industries.
- (1) Exclusionary conduct. This includes, among other things, predation, bundling and tying, and exclusive dealing.
 - (2) The anti-competitive use of licensing agreements that extend intellectual property rights beyond the scope intended under intellectual property rights laws. As part of this discussion, we address mandatory licensing.
 - (3) Excess or monopoly profits.
- 5.2 Exclusionary conduct deals with unilateral actions, which a dominant firm may use to protect, expand or extend its dominant position. Conduct which is not essential for the effective pursuit of productive activity, but rather which is designed to weaken or eliminate the competitive threat of actual or potential competitors and to deter effective entry is a particularly important competition issue in dynamically competitive industries. Its importance is a result of the nature of dynamic competition itself, the characteristics of these new economy industries, and our growing understanding of how acts such as predation, tying or bundling, or exclusive dealing can give a dominant firm a strategic anti-competitive advantage in these industries. The new focus of concern is more about the protection and extension of a dominant firm's position rather than about increasing short run monopoly profits, although in the long run, profits will be greater for the dominant firm if its dominance is maintained or expanded. All of these issues of exclusionary conduct are discussed in the Microsoft case study in Part II of this report.
- 5.3 Unfortunately, while predation, tying and bundling, exclusive dealing, and other forms of exclusionary conduct can be designed to strengthen and extend the dominant position of a firm, it is often difficult to distinguish behaviour designed to be anti-competitive from behaviour that is designed for legitimate business reasons. For example, how does one distinguish rational product integration from anti-competitive tying or bundling? This often makes it difficult for competition authorities to decide when they should intervene and when they should not. There are also important questions about whether the competition authorities can intervene in time, are able to design effective remedies, and whether the benefits of intervention outweigh the costs.

- 5.4 A second set of issues relate to licensing. There are two broad categories of problem that competition authorities are likely to encounter. They are the assessment of whether licensing terms and conditions are anti-competitive and the assessment of claims of anti-competitive refusals to license. Licensing is neither new nor limited to the industries of the new economy. What is new is that it is much more frequent and important to the efficient functioning of the new economy. For these reasons it requires greater scrutiny by the competition authorities.
- 5.5 The final issue is that of excess profits. Profitability issues can arise both in allegations of abuse of individual firm dominance or joint dominance. As unilateral behaviour (single firm dominance) is far more likely to be the source of questions of excess profitability in the context of dynamic markets, we discuss dealing with excess profitability in this chapter on unilateral behaviour. All of the issues and measurement problems are the same for the analysis of excess profits in the cases of individual or joint dominance, with the additional complication of the impact of varying market shares in industries subject to market scale economies. The section on excess profits (paragraphs 5.121 to 5.127) is short because the problem and most of the reasons why excess profits cannot be measured with any reasonable degree of accuracy are not new and are well documented. There is not much more to say except that in the new economy this line of competition enforcement is very difficult to implement because of the difficulties caused by uncertain product life cycles and the impossibility of determining the correct *ex ante* required rate of return to investors. If vigorously pursued, this line of enforcement could have potentially disastrous consequences for investment in innovation.

Predation

- 5.6 We begin with predation because it illustrates the rich array of anti-competitive exclusionary conduct that is possible in the dynamically competitive industries of the new economy and the fine line between legitimate business practices and anti-competitive conduct. It is useful to briefly review the development of the theory of predation. Up until 20 years ago predation was considered a pricing issue. Predatory pricing was defined as pricing below cost with the intent of driving a competitor out of business. Since this involves a cost, it would only make sense for a firm to engage in predatory pricing if, in the future, the firm could successfully drive the targeted competitor out of business and then exercise enough of the newly gained pricing power to raise prices for long enough to more than recoup its costs.
- 5.7 There has been considerable scepticism among economists and competition authorities about how often predatory pricing occurs and how effective it is. One good reason for scepticism is that charging lower prices is at the heart of competition and benefits consumers. When competitors complain to competition

authorities it may well be that they cannot compete with a more efficient firm. In any case the consumer benefits in the short run. Further, there is scepticism about the effectiveness of predatory pricing because if there is reasonably easy entry and low sunk costs, the targeted firm or other firms will likely re-enter the market once the price has been raised by the predator which will drive the price back down. This will make the predatory pricing strategy unprofitable.

- 5.8 There are, however, some situations in dynamically competitive high-tech industries where such predatory pricing rules may have to be applied carefully. Because high tech industries often have high fixed costs (and risk) in production, high tech products frequently exhibit high profit margins. Software is the extreme example, but other industries such as pharmaceuticals exhibit similar features. When marginal costs are low relative to the selling price – perhaps zero for software distributed over the Internet – simple tests for predation may be of little value. The Areeda-Turner test for example, which examines whether prices are below average variable cost, will not reveal predation if it occurs at prices above variable costs. It is entirely possible that predation could occur at prices above variable costs in industries that feature high fixed costs and significant economies of scale. When economies of scale are large, a small competitor may be forced to exit with prices that deliver positive product margins, but leave the firm unprofitable overall. Alternatively, in markets subject to network effects, penetration pricing at levels at or below variable costs may be employed in order to generate critical mass in the market. Such a strategy, in itself, demonstrates neither predatory intent nor effect. This discussion suggests evidence of simple price-cost margins should be treated with great caution. Indeed, they may not even be useful as a first screen for predatory behaviour. The critical step in evaluating predation, as in so many cases of exclusionary conduct, is to understand the nature of competition in the market.
- 5.9 In order to identify predation, the short-run loss test will need to be applied not against a product cost benchmark, but against the benchmark of what profits might otherwise have been expected, absent the expected anti-competitive outcome. Ideally, this information may be available from the company being investigated. This may be the case if the alleged anti-competitive act involved a particular project for which the business had modelled a variety of possible strategies. However, unless this information had been created prior to the competition investigation by the subject of the investigation, establishing and evaluating profits under a counterfactual scenario will be a challenging task at best. Hard evidence of intent can also be useful. What this analysis implies is that to properly analyse price predation in high tech environments one has to analyse whether the alleged predatory behaviour led to profits that were lower (but perhaps positive) than they would have been without the predation. This is consistent with a broader definition of predation developed by Janusz A. Ordover and Robert D. Willig (1981).

- 5.10 While predation has traditionally been considered a pricing issue there are other methods of predation. Ordover and Willig (1981) define predatory actions as those that are unprofitable without the exit of a competitor that it causes. They then discuss the potential for predation that takes the form of anti-competitive product innovation.
- 5.11 They argue that product innovations can be anti-competitive in at least two ways. Firstly, a product could be introduced solely to substitute for the products of a rival firm by diverting sales and reducing the competing firms' demand. Secondly, in a form of systems rivalry, introducing new components of systems that are incompatible with rivals' components, and then constricting the supply of the components that are compatible with the rival. This might be achieved by ceasing production, refusal to supply, or increasing the price of the compatible component. Either of these approaches could be predatory if they are used to exclude rivals.
- 5.12 Closely related to predatory R&D is pre-emptive patenting. Richard J. Gilbert and David Newberry (1982) show that a firm with monopoly power can have an incentive to maintain monopoly power by patenting new technologies before potential competitors, and that this activity can lead to patents that are neither used nor licensed to others; so called 'sleeping patents'. The monopolist will do this if the expected cost is less than the expected profits gained by preventing entry. While this behaviour is possible, Gilbert and Newberry note that there are many practical issues such as limited patent protection, the potential for many patentable technologies, and uncertainty that may make employing such a strategy difficult in practice. They also argue that banning pre-emptive patenting would not necessarily improve welfare. Rent seeking activity may be diverted to other means, for example strategic capital investment, which is less socially beneficial than excess R&D. Furthermore, they argue that it would be rare for improved technologies not to be put to use.
- 5.13 Notwithstanding Gilbert and Newberry's views on the difficulties of maintaining market power by patenting, there has been a large increase in the number of patents claimed in the United States over the last twenty years. Furthermore, at least some of this activity is 'strategic patenting', being used both to protect a firm's intellectual property from use by competitors, and to be potentially used to mount counterclaims against others who bring infringement claims. Given this, at what point does strategic activity of this type become anti-competitive? In principle, the simple test proposed to date should also be applicable in this case. If investments in intellectual property are being made that are only profitable if they prevent competition, then those investments are arguably predatory. However, as a practical matter, there have been no significant cases that we are aware of that have involved a claim of predation as a result of the strategic use of R&D in the patenting process.

- 5.14 Ordover and Willig argue that their general test for predation should be applied generally to such situations. Namely, the challenged conduct must substantially increase the probability of exit, and the conduct must involve a sacrifice of profit in comparison with the profits that could be earned, with the continued viability of the rival, if the innovator pursued an alternative strategy.
- 5.15 However, Ordover and Willig did not generalise the concept of predation far enough to cover all the relevant cases found in dynamically competitive new economy industries. Evans and Schmalensee (2001) define predatory acts as those that are rational only if they chasten or eliminate competition. This definition drops the necessity for exit which is important. The District Court in the Microsoft case argued that Microsoft committed acts that could be termed predatory to keep Sun's Java programming language from being as widely adopted as it might have been. Neither Sun nor Java have exited the market, but Microsoft was successful in dampening the demand for Java and hence succeeded in reducing a threat to Microsoft's dominant position in the market for PC operating systems. The multibillion dollar questions, one of which we will return to later, are what was this protection worth and does it matter. Fisher (2001) advocates a test of predation that looks at whether there is a deliberate sacrifice of money (profits) to gain or protect a dominant position. As good as this test of predation is, it is still not broad enough to capture all of the predatory anti-competitive behaviour that one needs to be concerned with.
- 5.16 For example, it has been suggested that one way for Microsoft to protect its dominant position in operating systems for the PC was to keep the popular applications programs from being available on other potential operating systems. According to this theory, one way of doing that was monopolising the market for popular applications programmes such as word processing, spreadsheets, etc., which in addition increased its profits. It has been alleged that Microsoft achieved this by failing to provide competing software applications firms such as WordPerfect with the necessary information and updates on the Windows operating system on which these programs run and that as a result these firms were substantially handicapped from developing their products which compete with Microsoft's own line of products. Note that the cost of withholding information from a competitor is likely to be negative. The purpose of this example is to show that predatory behaviour does not necessarily involve costs. It should also be pointed out that in the recent proposed settlement with the US Department of Justice, Microsoft has agreed to provide all necessary information on a timely basis to independent software developers for the Windows platform.

- 5.17 Therefore we would propose an expansion of the Fisher test for predation. We would argue that predation occurs where a firm either incurs costs or undertakes other actions which may be cost free or cost reducing, that it otherwise would not have taken had it not been for the anti-competitive benefits to the firm undertaking these actions.

HOW TO TEST FOR PREDATION

- 5.18 If we accept this generalised concept of predation, namely that predation by a firm constitutes conduct that would not have been rational except for the anti-competitive effects on one or more other firms, whether or not it involves a cost, then the key elements of such a test are to show:
- (1) that the firm undertaking the action stood to benefit from the anti-competitive effects of the conduct, and
 - (2) that there was not a legitimate business purpose or reason for undertaking the conduct, or if there was, that it would alone not have justified the costs (lost profits). This last condition is designed to cover the case where there is some legitimate objective but where achieving that objective would by itself not be worth the cost.
- 5.19 Given this definition, one would want to condemn all predatory acts, at least in theory, as they have no redeeming productive purpose that justifies their cost and we are left with just their anti-competitive effects. The only case against intervening in such cases would be that anti-competitive effects may not be great enough or of sufficiently significant long-term interest to justify the costs of enforcement. There should be no need to show that the anti-competitive benefits to the offending firm outweigh its costs of predation, if there are any. Clearly, the management of the firm undertaking the predatory conduct thought that the anti-competitive benefits would exceed the costs. Generally, when economists consider the conduct of firms, we assume that conduct to be economically rational. Even in cases where we may question the rationality of some action in a competition policy context, we do so with some misgiving because we generally do not believe that a government regulator or court can determine what is in the rational self-interest of that firm better than its management. This is certainly more likely to be the case for highly successful firms such as Microsoft where the management has clearly made a lot of good decisions leading to high profitability. Furthermore, in the case of non-price predation there is no benefit to consumers such as from lower prices during the predatory period that might offset future price increases, particularly if the predation scheme was not effective.

5.20 As Evans and Schmalensee (2001) point out, the US Supreme Court in the *Brook Group*¹⁶ decision required a recoupment test for price predation. They summarise the court's recoupment test and its rationale as follows:

In *Brook Group* the court required that plaintiffs establish that below-cost pricing had occurred and the defendant had a reasonable expectation of recouping its predatory losses through future price increases. The Courts rationale for the recoupment test was that, even if below-cost pricing by a firm may hurt some of its rivals, if it is unable to recoup its losses, then aggregate market prices are lower, consumer welfare is enhanced, and the apparently predatory pricing scheme should not be condemned (footnote omitted). In other words, even if there is harm to competitors, a court must be able to find harm to competition – and thus ultimately, to consumers – in order to find an antitrust violation. (p30)

5.21 While this logic may apply to standard price predation, it does not apply to non-price predation. The consumer bears the cost of the predation, which may be hard to measure particularly when it is the result of exclusionary conduct where the effects will be in the future. The costs, if any, of non-price predation will be a waste of resources and they do not accrue to consumers as in the case of classic predatory pricing. Therefore, to compare the costs of the anti-competitive conduct, if any, (incurred by the offending firm) with its benefits (received by the offending firm) tells us only that from a social welfare point of view resources have been wasted and a lessening of competition has occurred.

5.22 Why then is non-price predation potentially so important for competition policy for new economy industries? It is because of the numerous interfaces and interdependencies that are critical to make products work successfully. Denial of timely access to information about new platform characteristics or of access to critical interfaces which are necessary for a firm to compete can have devastating effects on a firm's ability to compete effectively. A firm that has control over access to information or interfaces can therefore, at little cost, cause serious harm to actual or potential competitors. Also, short run positions of dominance can be leveraged into long-term positions of dominance through such exclusionary tactics. Further, network effects often mean that the impact of even temporary predatory conduct can have major impacts on the outcome of a competitive contest. Just delaying a competitor can tip a market in favour of the predator. When one of the firms in the contest is a giant with powerful established positions in a number of closely related markets, the potential for highly effective predatory strategic conduct is immense, even in winner-take-all

¹⁶ *Brook Group Ltd v Brown and Williamson Tobacco Corp*, 509 US 209, 113 S.Ct 2578; 125 L.ed 2d 168 (1993)

situations. Through such conduct the current winner may become the entrenched or perpetual winner if continued and systematic predation is allowed. An example of this can be found in the Microsoft case described in Part II of this report. By repeatedly engaging in predatory behaviour, it is argued that Microsoft has built a reputation for predation. This in turn has made entry less attractive to potential competitors. According to the judge in the case (Judge Jackson):

Most harmful of all is the message that Microsoft's actions have conveyed to every enterprise with the potential to innovate in the computer industry. Through its conduct toward Netscape, IBM, Compaq, Intel, and others, Microsoft has demonstrated that it will use its prodigious market power and immense profits to harm any firm that insists on pursuing initiatives that could intensify competition against one of Microsoft's core products... The ultimate result is that some innovations that would truly benefit consumers never occur for the sole reason that they do not coincide with Microsoft's self-interest. (Findings of Fact, paragraphs 411-412)

- 5.23 Judge Jackson clearly believed that Microsoft's strategy helped to give it a reputation for reacting aggressively and anti-competitively to any entry that it perceives as a threat to its dominance in the operating systems market. Such a reputation is likely to deter future entry.

THE DIFFICULTY OF ESTABLISHING PREDATION

- 5.24 Because by definition, predation is anti-competitive conduct where there is either no productive business purpose or no productive business purpose that would justify the costs of the conduct, it should be condemned by the competition authorities. At the same time, alleged predatory behaviour can be difficult to distinguish in some situations.

(1) Where there is intense winner-take-all competition for a market.

(2) Where there are legitimate business objectives that can be given to justify the conduct.

- 5.25 Even if there are or can be legitimate business reasons for undertaking certain conduct, a competition authority may want to forbid that conduct if the anti-competitive harm far outweighs the productive benefits. This will be discussed further in connection with tying and exclusive dealing which can have exclusionary anti-competitive effects but in some cases serve productive purposes. In these situations a full rule of reason analysis is required to determine whether such conduct should be condemned on the grounds that the anti-competitive costs far exceed any productive benefits.

While this report does not attempt to resolve all the practical difficulties associated with analysing predation claims, it is useful to consider the cases of winner-take-all markets and product pre-announcements as illustrations of situations where charges of predation arise and where the analysis can be difficult.

WINNER-TAKE-ALL MARKETS

- 5.26 The problems associated with analysing predation are at their most fundamental when markets which can be described as ‘winner-take-all’ are encountered. In such markets, competition takes place **for** the market. Such markets will ultimately feature a single dominant player, that is likely to be highly profitable, and one or more competitors that lose the race to dominate, and either remain as fringe players, or exit altogether. In such markets, competition is a race to become the dominant player, with competition extreme during the early stages of the race. If only one player can win, then the winning strategy involves the elimination of competitors. This implies that exits will occur and that firms understand this, so that the intent to cause your competitors to exit is nothing more than the equivalent of wanting to prevail in the competition and be the surviving firm.
- 5.27 Players in such a race will view competition not in terms of current prices and revenues, but as a risky investment project. Like any project, cash flow can be expected to be negative initially, and positive in future periods. In fact, any player that is sufficiently financed could spend up to the present risk-adjusted value of anticipated profits in the initial competition in order to win the market.
- 5.28 Evans and Schmalensee (2001) argue that in such a market there is no cost-based test for predation that is meaningful. Furthermore, they argue that ‘resorting to intent evidence adds heat, not light, as the only option is to destroy the competition and make money thereafter’. Ahlborn *et al* (2001) agree, and conclude that:

Despite that fact that new economy firms in an innovation race satisfy the AKZO test (ie, they price below average total cost and intend to eliminate their competitor(s)) a finding of abuse of dominance and an intervention by the Commission in such circumstances would be unnecessary, harmful and futile. An intervention would be unnecessary because many new economy markets are very competitive despite being highly concentrated: competition just takes a different form from competition in old industries. It would be harmful because any intervention is likely to restrict competition between new economy firms and slow down the innovation race. And it would be futile because the ultimate market structure (ie, a fragile monopoly) is not the result of the behaviour of the surviving firm (although the identity of the survivor may well be), but the result of the cost structure and network effects that characterise the industry.

- 5.29 As a result of these issues, Evans and Schmalensee (2001) believe that if a defendant can show competition is winner-take-all, this should be a complete defence against (pricing) predation. However, they do not suggest it should shield firms from other possible antitrust charges. Katz and Shapiro (1998) agree that predation can be difficult to measure in these markets, and that with legitimate incentives to engage in penetration pricing, even negative prices might not be predatory. It is important to note that the remarks of Evans and Schmalensee are directed to price predation. Non-price predation is a very different matter and winner-take-all markets may make non-price predation even more important and effective.
- 5.30 Dealing with predation claims in winner-take-all markets may be particularly difficult. As noted above, simple price/cost based tests are likely to be unhelpful in determining price predation. The investigating authority will need to get a good understanding of the market and the nature of competition, and therefore the alleged predators likely motivations, before being able to conclude whether predation is a meaningful concept. In particular, in the face of a defence based on the premise that predation is meaningless in a winner-take-all market, an investigating authority should establish that the market in question was in fact characterised by a competitive race of this nature, and whether the claims of predation involve simply price predation or some form of exclusionary conduct.
- 5.31 The statements quoted above may be correct for price predation in winner-take-all markets, but what is true for price predation is not generally true for other non-price forms of predation. Sometimes analysts fail to make this distinction which can lead to serious errors. Further, with regard to intent, statements about winning the competition and causing the exit of other firms may not be significant. However, other types of statement about a plan to interfere with a competitor's access to critical interfaces or other necessary resources may be highly significant evidence of intent in the case of non-price predation. The investigation needs to keep focused on the alleged predatory conduct and to perform the appropriate analysis, avoiding being sidetracked by generalisations about price predation in winner-take-all markets that are then unthinkingly applied to the other types of predation.

PRODUCT PRE-ANNOUNCEMENTS

- 5.32 Claims of predatory pre-announcements have been raised in such high profile cases as the Microsoft case and illustrate some of the difficulties that arise in evaluating such claims. There are times when, to inform customers of impending products, products are announced before they are commercially available. Pre-announcements can be an important tactic in markets subject to network effects. Customers often understand that some products (such as software applications)

are subject to network effects, and therefore understand that the size of the eventual installed base matters, both to their convenience of use and to the potential longevity of the product. Given this, influencing customer *expectations* of which product will win becomes important. The product that is expected to win will get the bulk of sales, and therefore has a good chance of actually winning. With pre-announcement, some (potential) customers may be persuaded to wait for a new product. This both reduces the installed base of the competing technology, and increases the size of the new base when it initially launches. This tactic is prevalent in software, where there is even a term for it – vapourware.

- 5.33 This type of tactic may work particularly well for a large supplier with an established brand. Assume for example, that a small start-up software firm creates a new business application. An established rival does not have anything equivalent, though it looks like the upstart competitor has come up with a ‘winner’. The incumbent has a number of options, one of which is to rapidly develop a competing product. If the incumbent responds to the new product by announcing that it is about to launch a competing product within the next twelve months, many customers may wait for the incumbent. They may do this even if they understand that the incumbent may not even have started work on the product, and that the announced delivery date may not be met. This is because investing in new software products is risky. It is difficult to assess the quality of the product without installing and running it for some time, by which time most costs associated with purchasing and installing the product are sunk. There will inevitably be strong incentives to go with a major supplier that gives more certainty of adequate product support and development being available in the future, and an increased likelihood of the product becoming an application that is in widespread use.
- 5.34 Product pre-announcements are a fairly normal marketing tool for many industries, and products such as the latest motion picture or new model of motor vehicle are often announced before they are available to the public to generate media interest, build market demand, and so on. So in general, product pre-announcements cannot be considered a problem. There are two circumstances when pre-announcements might be a problem however:
- when the objective is to exclude a competitor, and
 - when blatantly dishonest information is disclosed. Clearly, no firm should be in the business of distributing misleading information, and dominant firms with the potential to alter market outcomes should certainly not be able to employ such tactics.

- 5.35 The main difference between normal, pro-competitive pre-announcements and predatory anti-competitive announcements is that the first is designed to boost demand for a product, while the second is intended primarily to exclude competitors in addition to boosting demand for a potential future product. Anti-competitive pre-announcements, like the case of withholding critical information about system interfaces will probably not involve a significant cost (sacrifice of profit) at the point of the pre-announcement. Investigating allegedly anti-competitive announcements may therefore largely be a legal issue, a matter of establishing facts that demonstrate both intent and effect on a competitor. However, economic analysis will still be needed to establish that the alleged predator was in a dominant position, and to establish that expectations would have a critical impact on market outcomes.
- 5.36 When dealing with allegedly anti-competitive pre-announcements, there are some general points that should be carefully considered before concluding that competitive harm has been done. It should be noted that, from a customer perspective, if the purchase of a good of uncertain quality involves sunk costs of purchase and installation, and potential future switching costs if the good is a 'loser' in the long term, it is entirely rational to prefer to rely on a firm with a reputation for producing winning products. Even if the entrant had in fact produced a technically superior product, as a commercial matter customers make rational risk/return judgements, with product functionality only a part of the decision process. Furthermore, it is widely known in technology markets that 'vapourware' tactics are employed, and that products are often delayed, so customers are likely to be aware of the risk of delay. These considerations imply that an investigating authority should not be overly influenced by claims that an inferior product 'won' a market race, on the back of expectations built on 'anti-competitive' announcements. Particularly in markets for technical goods sold to large firms, customers can be highly sophisticated, and well aware of the games that are played. It should therefore be kept in mind that while pre-announcements *may* affect market outcomes, it is equally likely that they have had remarkably little effect. This illustrates how difficult it can be in practice to properly analyse claims of predation.

Tying and bundling

- 5.37 Tying has typically been treated harshly in the US Courts and by competition authorities in general. Until the recent Microsoft case, tying has been considered a '*per se*' violation of the US antitrust laws if it was established that the firm involved had market power in the tying product and that the tying and tied products were in separate markets. In the EU tying can be an illegal abuse of dominance. Economists on the other hand have long argued that some of the anti-competitive theories of tying are incorrect and that in many cases tying or bundling is used to meet legitimate business purposes and should not be

uniformly condemned. One of the issues that Evans and Schmalensee (2001) raised in connection with Microsoft's integration of its browser into the Windows operating system was the question of when is it a rational business decision that integrates the functionality of two different products into one, and when is it tying? They further point to the fact that Microsoft had been criticised for being slow in responding to the internet, and that all other operating systems have browsers. Why then should Microsoft's inclusion of their browser in the Windows operating system not be considered rational product integration rather than be condemned as tying integration. We will return to this question and the Court of Appeals answer, after briefly discussing the concepts and theory of tying and the associated concept of bundling. A more detailed description of the Microsoft case can be found in Part II of this report.

- 5.38 The terms bundling and tying are often used loosely, and can cause some confusion, as the concepts are closely related. However, it is important to differentiate the practices, as the underlying motivations for their employment are likely to differ. **Tying** refers to a situation where a purchaser of a good, good A (the tying good), agrees to purchase another good, good B (the tied good) as a condition of purchasing good A. **Bundling** practices are closely related, with the main difference being that seller usually sells a package at a single price per bundle.
- 5.39 When goods are tied by contractual means, the goods may be offered with separate prices. This is likely when the tied goods are used in varying proportions. An example given is a photocopier and copying paper, where the manufacturer of the copier insists on its own brand of paper being used. Product ties may be implemented by contractual means, for example by the purchaser agreeing to purchase the input on an ongoing basis as part of the sale terms, or by conditions such as the warranty on the machine being invalidated if 'original equipment' parts or consumables are not used. Alternately, if product components are designed to be incompatible with other manufacturers, the products are also tied. An example of this is computer printer toner cartridges, where the cartridge design is often patented and therefore only OEM refills are available.
- 5.40 Bundling can be either pure or mixed. Pure bundling means the goods are only available as a package, while with mixed bundling products are available either individually or as a package, with the package price less than the sum of the component prices. When goods are only available as a bundle, then they are also tied. Mixed bundling is less likely to be anti-competitive than tying or pure

bundling, as it allows consumers to separate the supply of the ‘tying good’ from the ‘tied good,’ and therefore does not reduce the demand available to monoline suppliers to the same extent.¹⁷

MOTIVATIONS FOR TYING AND BUNDLING

5.41 Competition authorities will most often come across bundling and tying practices in the context of a complaint alleging that the practice is anti-competitive. However, there are a variety of reasons that a seller may have for choosing to tie or bundle products that are not anti-competitive. We therefore discuss a number of likely motivations for bundling and tying that can be expected to be encountered in dynamic markets, and note issues that need to be considered when dealing with each practice.

ESTIMATING WILLINGNESS TO PAY

5.42 When consumers have varying willingness to pay for products, and the seller cannot directly discriminate between consumers with different reservation values, bundling products can reduce the dispersion in the total price that consumers are prepared to pay for a group of products. As a result, the seller can earn more revenue. This effect can perhaps best be seen in a simple example. Assume that two consumers value two computer games as shown in the table below:

TABLE 4.1 – VALUE OF COMPUTER GAME

	<i>Game 1</i>	<i>Game 2</i>
Consumer 1	£20	£8
Consumer 2	£8	£20

5.43 If the software firm aims to maximise revenue, and must post a single price for each game, it will chose to sell each game for £20 and make £40 revenue. However, if the games were bundled, they could be priced at £28, selling two bundles for total revenue of £56. As well as increasing the firm’s revenue, more games are sold (that is, market volumes have increased), indicating an improvement in consumer welfare.

¹⁷ Of course, even mixed bundling can be akin to tying when the incremental price of the bundle is very low relative to the price of each product separately. This may occur where the incremental cost of supply is very low, which is a feature of many high tech markets.

- 5.44 This example is a pure bundling strategy. However, if we modify the scenario slightly, the advantages of a mixed bundling approach can also be seen. Assume there are now two more consumer types, consumer 3 who values game 1 at £20, but has no demand for game 2, and consumer 4, with the opposite values of game 1 and 2. If this is the case, it will pay to offer each game individually at £20, or both games for £28. If the software seller does this, they will still receive £56 from consumers 1 and 2, but will also make another £40 from consumers 3 and 4 who would not have purchased the bundle.
- 5.45 Shapiro and Varian (1999) argue that these types of pricing approaches are common in information industries, and describe the pricing of such everyday goods as CDs and magazines. While a magazine may target a particular market segment, most include a variety of articles and content, knowing that each purchaser will only read some of the content, but aiming to provide a wide enough range of content that a significant number of readers buy the magazine. The reason that such a pricing approach is more common in information and software type products is that the marginal costs of adding product (or content) to the bundle is close to zero. While this approach would still work in other industries from the demand perspective, the cost of additional products that are not wanted by the purchaser often makes such strategies uneconomic. Given the cost structure in many high-technology markets, this type of pricing practice is likely to be regularly encountered by competition authorities.
- 5.46 This type of bundling can increase the seller's revenue (and volumes sold) when compared with a situation where the seller is unable to bundle. In general, this type of pricing is unlikely to harm competition and is likely to enhance consumer welfare. However, it may raise difficult issues when suppliers of part of the bundle in question believe that such practices by full-line suppliers are foreclosing access to the market. In dealing with such claims, two points should be kept in mind:
- Firstly, mixed bundling is less likely to prevent competition from suppliers of single products or part-bundles than pure bundling. Mixed bundling creates additional value when compared with a pure bundling strategy by offering a high price for consumers that prefer only one product from within the bundle. As such, this creates an opportunity for competitors.¹⁸

¹⁸ However, as we discuss further below, it can still significantly affect the demand a monoline producer faces.

- Secondly, in attempting to assess whether the practice is anti-competitive on balance, it is useful to consider whether the practice is likely to increase or decrease the total volume of sales. Practices that increase the volume of a good sold are generally welfare enhancing, while those that reduce volumes are likely to be detrimental to welfare.

5.47 Whether or not the practice prevents competition is an issue of whether it forecloses access to a relevant market. This is discussed further below.

COST SAVINGS

- 5.48 There may be significant cost savings in the production, distribution, marketing, or licensing of products that are sold together, when compared with individual sale, that encourages bundling and package sales. If bundling is driven by cost savings, and the products are not physically or technologically bundled, then the seller should be able to induce purchasers to take the bundle through offering appropriate pricing packages. The products should not need to be tied.
- 5.49 Bundling undertaken as a result of transaction cost savings increases economic efficiency, through lowering costs, with at least some of the benefit passed to consumers in the form of a (lower) package price. Such bundling is not anti-competitive. Even if the pricing results in competitors being unable to compete, it should be noted that exclusionary pricing is not necessarily anti-competitive. Efficient firms can offer low prices that exclude competitors. This is only anti-competitive if it is done specifically for the purposes of excluding competitors, with a view to being able to increase prices or maintain a dominant position in the future as a result of the exclusion. In other words, when the practice is predatory.

QUALITY ASSURANCE

- 5.50 A frequent justification for tying that is likely to be particularly relevant in high tech markets is the argument that firms need to tie products together in order to protect their reputations. In complex systems it may often be difficult for consumers to apportion blame to a particular part of the system when the system as a whole stops working. Firms may be worried that they will be blamed, and that their reputations will be damaged by the inadequacies of complementary products supplied by other firms. In this situation it makes sense for the firm to wish to supply the whole of the system.
- 5.51 As high tech markets are often characterised by system complexity, this may be a justified concern. Tying can be efficiency enhancing in such circumstances, allowing quality suppliers of complex equipment or services to protect their reputations, and hence the prices needed to justify manufacturing superior

quality systems. However, this is also a relatively easy explanation to abuse, as it is easy to claim such effects, and difficult for an industry outsider to verify whether such concerns are genuine. Furthermore, many complex systems can be maintained by other firms or repaired with non-OEM components without loss of quality, by way of such approaches as certifying suppliers and service centres. The main challenge in dealing with such claims is therefore the factual problem of establishing whether this justification is valid, or simply a smoke screen. If the validity of the claim is dubious, then the next step is to identify what the real motivation for the practice is.

- 5.52 An excellent example that raises scepticism about this line argument comes from the US telephone industry. When AT&T had a monopoly in telephone services in the US, it also had a monopoly on the manufacture and installation of telephone equipment. This was justified on the grounds of being able to guarantee system performance. When AT&T was broken up and the monopoly ended, an innovative highly competitive telephone equipment manufacturing industry came into being that offered consumers a wide range of choice of on premise equipment that was wired to the customer's needs. Without doubt the consumer benefited from better, cheaper and more varied products. Contrary to predictions of a collapse in quality, the transition occurred virtually without significant problems for the quality of service. The consumer clearly benefited and one of the most dynamically competitive industries in the world was born.

PRICE DISCRIMINATION

- 5.53 Firms with market power may wish to price discriminate between purchasers. In many cases the value a particular purchaser attaches to a product will vary with the amount the product is used. By tying goods, the seller may get a better indication of usage, and therefore be able to price more precisely to customer demand. This approach, known as metering, is considered the motivation behind the example of tying already mentioned (photocopiers and copying paper).
- 5.54 Unlike justifications such as cost savings, the seller must have market power in the tied good market to employ this strategy. The economic analysis of price discrimination suggests that consumers may either gain or lose from metering, depending on the circumstances. However, in markets subject to high fixed costs or network effects, there are reasons to consider such practices carefully before concluding they are detrimental to welfare.

- 5.55 When high fixed costs are incurred, price discrimination can be an efficient way to recover those fixed costs. As metering may provide a good estimate of customer demand elasticity, it may provide a good approximation of Ramsey pricing,¹⁹ and enhance overall consumer welfare.
- 5.56 If the tied good market exhibits strong network effects and scale economies, metering-type pricing approaches may also improve welfare. An example is computer games such as the systems of Nintendo, Sega and Sony that depend on a dedicated gaming console and separately sold games. Katz and Shapiro (1994) describe how efficiency may be enhanced in such a market by cross subsidising from the tied (and metered) good to the tying good. The tie in this case is technical; games in the format specific to the manufacturer's console must be purchased in order to use the console. In these markets, there is a link between the size of the installed base of consoles, which then drives demand for games, and the price and variety of games available. Software production is dominated by fixed costs, resulting in significant economies of scale that in turn creates markets that are monopolistically competitive. Software is therefore not priced at marginal cost. By using the margin from software sales to reduce the margin on hardware sales (perhaps to negative margins), marginal hardware buyers are attracted, increasing the installed base of hardware. This may lead to greater variety and lower prices in software due to increased demand for games combined with scale economies in software production, increasing the welfare of all consumers on the network. This type of approach is not uncommon in markets where there is consumer resistance to the initial cost of joining a network, with similar logic being used by cellular mobile network operators when providing subsidies on the purchase of cellular handsets.
- 5.57 An example of a case in which the competition authorities were concerned about such a pricing structure is the Video games case described in Part II of this report. The UK Monopolies and Mergers Commission (MMC) was concerned that Sega and Nintendo had established a discriminatory price structure for software and hardware which resulted in prices for software that were excessive in comparison with prices for hardware. However, the preceding analysis has argued that this may in fact be efficient.
- 5.58 The effect of price discrimination on consumer welfare can be positive or negative. Broadly speaking, if it raises total output it is likely to have a positive effect on consumer welfare, whereas if it lowers total output it will definitely have a negative effect on consumer welfare. Accordingly, any analysis of price

¹⁹ It is economically efficient to recover fixed costs more from consumers with a relatively high willingness to pay for a product than from those with a lower willingness to pay. This is the essence of Ramsey pricing.

discrimination in the context of tying should consider whether the tie leads to an increase or a decrease in output. In the context of high tech markets it should be noted that price discrimination might well be socially optimal as it may allow the high fixed costs of production to be covered in situations where they could not be covered in the absence of price discrimination. So our view is that tying used to price discriminate between customers is more likely to be socially optimal in a high tech market (high fixed costs, low marginal costs) than in other markets. Furthermore, these practices in themselves will rarely have a negative impact on the competitive process, and therefore will rarely be anti-competitive by this measure.

FORECLOSING COMPETITION

- 5.59 The primary anti-competitive concern about tying in high tech markets is the potential for foreclosure. This was the central issue in the tying claim in the Microsoft case, described in Part II of this report. The foreclosure theory of bundling and tying asks whether bundling two goods A and B, when the market for product A is monopolised, can profitably harm competition in the market for the tied good B. The Chicago critique is that this is not possible, as only one monopoly profit is available to be earned. In other words, if bundling A and B can lead to a profitable increase in the price of B, an equivalent result could always be obtained by simply increasing the price of A. Economic analysis has shown that the Chicago critique is valid, but only when the market for good B is perfectly competitive, and when the goods are used in fixed proportions (such as nuts and bolts, or left and right shoes). The fixed proportions requirement means that, in practice, the two goods can be viewed as one unit, in which case it is not surprising that there is only one monopoly rent to be earned.
- 5.60 Economic thinking on the potential for foreclosure has moved on considerably over the last 20 years. Michael D. Whinston (1990), showed that when there are scale economies in the tied good market, reducing the sales volume of a competitor in the market for good B may reduce the competitor's profits to the level that exit is induced. The reduced level of sales available to a single product competitor may also deter entry to the tied good market. Nalebuff (1999) examines bundling in an oligopolistic environment, and shows that bundling can be a highly effective entry deterrent strategy. Nalebuff also shows that an incumbent monopolist of two goods A and B, that faces a single good entrant to the market for B, can significantly reduce the entrant's profits at very little cost to itself by bundling those two goods.
- 5.61 The key to Nalebuff's model is that individual consumers have different valuations of both goods. The monopolist (and entrant) must offer either a single price for each good, or for a bundle of the two goods. The optimal price set under these circumstances will be lower than the reservation price of each

consumer that chooses to purchase, except in the case of the marginal consumer. Given this, an entrant providing good B alone in competition with a bundling incumbent will be able to win some customers that have a high value for good B. However, the customers that buy the entrant's good B will only be those that both have a high value for good B *and* a low value for good A. The intuition then is that the entrant can be effectively limited to competing in part of the market by the fact that some customers value both products highly. Nalebuff shows that the discounting that is needed to overcome this can be severe, leading to a severe loss of profitability for the entrant. When combined with scale economies, this implies that bundling could be used to either deter entry or induce the exit of rivals.²⁰

TWO LEVEL ENTRY

- 5.62 If goods are tied, and a competitor must enter with a bundle of products rather than a single product, this may deter entry. 'Two level entry' refers to needing to enter two vertical stages of production. For example the two levels might be hardware and software, or manufacturing and distribution. However the effect may also operate horizontally, if it means that several new products have to be developed at once.
- 5.63 Whether or not this effect is likely to deter entry will depend on whether the presence of bundled competitors requires a new entrant to also produce all the products or services in the bundle (these may be available by partnering with other firms), and on whether the requirement measurably increases the difficulty of entry. However, the underlying economic characteristics of many high technology markets, including large fixed and sunk costs leading to few 'winning' firms, strong incumbents, network effects and in some cases winner-take-all product races would suggest that entry risk will often be high. The need to enter multiple product markets simultaneously may therefore create a significant barrier to entry.
- 5.64 Tying or bundling for the purposes of excluding competition either by deterring entry or causing exit is basically a predation story. It has the potential to harm competition in both the tying and tied good market. Of course, as already noted, there may be efficiency enhancing motivations for this practice as well so that it should not be condemned without analysis. The pro and anti-competitive effects will need to be balanced.

²⁰ An interesting feature of Nalebuff's model is that it shows that bundling can mitigate the impact of competition on the incumbent, even if actual entry occurs. An entrant can therefore expect the bundling strategy to persist, even without any commitment on the part of the incumbent.

CONCLUSIONS

- 5.65 There are a large number of economic models of bundling and tying. In general, the conclusions on the welfare effects of various practices depend heavily on the assumptions underlying the particular model in question. This implies that theory alone will not provide definitive answers on when bundling or tying is anti-competitive—a factual analysis of each case is required. What can be concluded is that the Chicago critique that such practices are likely to be innocuous or pro-competitive cannot be accepted as a general rule. Current economic thinking shows that bundling and tying can, under certain conditions, be used to foreclose markets. Clearly, the conditions needed for foreclosure to be possible, such as scale economies in the tied good market, and oligopolistic competition, are likely to be met in practice in high technology markets.
- 5.66 In the context of dynamic industries, issues that need to be considered that can justify tying or bundling include:
- the potential for price discrimination to lead to efficient recovery of fixed costs,
 - the need for firms selling complex systems to protect their reputations,
 - the ability of bundling to reduce prices and increase sales,
 - the potential for cost savings from bundling, and
 - rational product integration.
- 5.67 Against this one has to look for and evaluate the potential for using these practices to foreclose competition. Firms competing in markets involving large fixed (and sunk) costs face significant risk when entering markets, and require reasonable prices and volumes to survive. Commercial practices that reduce the share of the market available for the entrant to contest, reduce the price the entrant can expect for its products or substantially raise the risk, may have considerable potential to deter entry, and reduce innovative investment in new products.
- 5.68 Clearly tying and bundling are complex issues for competition authorities and serious errors can be made if tying or bundling are condemned as anti-competitive without a thorough analysis of why they were used and what their competitive effects are. Tying and bundling should not be condemned as acts that serve no legitimate productive purpose, as for the most part, they have been by the US Courts. This is particularly true in high-tech dynamically competitive industries. It is highly significant that the US Court of Appeals in its

decision in the Microsoft case²¹, while upholding many of the charges against Microsoft for anti-competitive conduct, remanded the tying case against Microsoft back to the lower court to be tried under a rule of reason analysis. The US Court of Appeals states:

We hold that the rule of reason, rather than per se analysis, should govern the legality of tying arrangements involving platform software products... There being no close parallel in prior antitrust cases, simplistic application of per se tying rules carries a serious risk of harm. (p69)

- 5.69 Our analysis would support the Court's opinion and we would recommend this approach in many cases where tying or bundling is found to occur in the high-tech industries of the new economy. The opinion of the Court in the Microsoft case that tying should be considered under a rule of reason, not as a *per se* abuse, is discussed further in Part II of this report.

Exclusive dealing

- 5.70 In order to compete in a market, a potential competitor must have access to both a competitive product, and the means to deliver that product to customers. The ability to foreclose a competitor's access to 'channels to market' can therefore be a very effective way of restricting competition. Exclusive dealing arrangements, where a distributor agrees to supply the products or services of only one manufacturer, have the potential to have exclusionary effects, and could be anti-competitive if a significant percentage of distributors become locked into a single or small number of manufacturers.²²
- 5.71 Exclusive distribution agreements are not necessarily anti-competitive. In Part II of this report, we describe the European Commission's investigation of Iridium, a satellite communications venture. The Commission concluded that, in the absence of exclusive agreements, the venture would not have taken place, as it involved considerable risk and substantial investment. Therefore, the exclusive agreements did not restrict competition **that would otherwise have happened.**
- 5.72 Exclusive dealing can be achieved either directly by agreeing that the distributor will only distribute a single manufacturer's product, or indirectly by contractual terms and conditions that create incentives that, in practice, lead to exclusive dealing. An example of this was a licensing practice used by Microsoft in the

²¹ United States Court of Appeals, No. 00-5212, *United States of America, Appellee v. Microsoft Corporation, Appellant*. Decided 28 June 2001.

²² *Exclusive distribution*, where the distributor locks up key manufacturers and excludes competing distributors can also be a problem in some circumstances. However, we are not aware of issues relating to exclusive distribution that are particular to high technology markets.

early 1990s, and one of the causes of a complaint against Microsoft laid by the US Department of Justice in 1994. The practice involved license agreements with manufacturers and distributors of personal computers that charged the distributor a fee 'per processor', for every system sold by that distributor, regardless of whether or not the computer was shipped with Microsoft's operating system or a competing operating system. The Department of Justice argued that in practice this meant that actually installing Microsoft's system on each computer had zero marginal cost, meaning it was very unlikely that distributors would incur the additional cost of installing a competing operating system.

- 5.73 There is relatively little explicit discussion of exclusive dealing in the literature on competition policy in the context of high technology, dynamic industries, as in general the analysis is parallel to that in other industries. The exclusive dealing practice needs to be examined for both pro- and anti-competitive effects. Exclusive dealing, by definition, reduces the distribution channels available to competitors. Against this, there are a variety of pro-competitive and efficiency enhancing motivations for exclusive dealing, including issues such as reducing the manufacturer's risk by ensuring continuing demand for its product, and providing adequate incentives for the retailer to invest in promoting and supporting the manufacturer's product. However, there is one issue worthy of particular mention in the context of this report—the relationship between markets prone to tipping and exclusive dealing.
- 5.74 If the market is prone to tipping, then exclusive dealing may be able to assist in tipping the market. It is worth noting, that even a small percentage of dealers accepting exclusive contracts at an early stage may help a firm in a winner-take-all race. Assume for example, that two software manufacturers are competing in such a market. Further assume that consumers are currently indifferent between systems, with both systems available from all distributors. Market share of sales is running at about 50 per cent for each supplier. However, if one becomes more common, a consumer will prefer that package because of the compatibility benefits of a larger installed base. Now assume one of the software firms 'bribes' 20 per cent of distributors to enter exclusive dealing agreements. If consumers are indifferent between products, the software firm with the exclusive arrangements will get all of the sales from the exclusive outlets (20 per cent of the market), and half of the remainder (40 per cent of the market). The exclusive distribution arrangement has now created a firm with a market share advantage in sales of 60 per cent compared to the competitor's 40 per cent. Once this becomes known, given that consumers

prefer the product with the larger installed base, the market may tip. The process may be assisted by more distributors entering the exclusive arrangement, as the winning firm gains market power.²³

- 5.75 It can be argued that tipping in the above simplified example is of no consequence, as the market was bound to tip anyway, and all the arrangement did was speed up the process. Furthermore, both players can pay dealers to enter exclusive arrangements. In this simplified example that is, of course, correct. However, in a world of imperfect information competition authorities should be wary of the potential for a firm with a superior distribution strategy, or market power in other markets that can be leveraged by coercing distributors, to tip a market in their favour even if they have a technically inferior product.
- 5.76 There are at least two other considerations that arise from this analysis.
- Firstly, a firm without market power, operating in a market subject to tipping, may be able to influence market dynamics by securing exclusive distribution rights on a scale that, in most circumstances, would not give rise to competitive concerns.
 - Secondly, it should be remembered that intervening once the market has tipped may have little or no effect. The US Department of Justice intervened in Microsoft's licensing practices in 1994. However, by this time Microsoft had such a lead in their market share of operating systems that it probably did not matter greatly.
- 5.77 These observations imply that a competition authority may need to consider, if it believes there is value in intervening, intervening earlier than would normally be the case. It may also be necessary to consider the potential impact of business strategies that would not normally raise competition law concerns on both the path of development of the market, and on the potential for future competition.

Conclusions on exclusionary conduct

- 5.78 Anti-competitive exclusionary conduct can be carried out in a wide variety of ways in dynamically competitive industries. When there is no legitimate business objective for the conduct, these practices should be condemned by competition authorities. Sometimes the conduct is blatantly anti-competitive and then it is a clear cut case of predation as broadly defined. In many other

²³ This example is contrived, of course, but may still be a useful simplification of real world behaviour. It is interesting to note that Baseman et al (1995) report that Microsoft made only 20 per cent of its sales under the per processor license system in 1989. However, this figure rose to 22 per cent in 1990, 27 per cent in 1991, and 50 per cent by 1992.

cases, however, such as with tying and bundling, an in-depth analysis is required into the business purpose, intent, and competitive effects of the conduct. Unfortunately, most important cases cannot be correctly decided without a full analysis such as required under the rule of reason in the US. This means that fixed rules to determine abuse of dominance or *per se* violations have the potential for causing significant harm as the US Court of Appeals decision in the Microsoft case notes.

- 5.79 However, even if the competition authorities do properly analyse and identify anti-competitive exclusive conduct, there are serious questions as to what the remedy should be. Often the anti-competitive actions have taken place and cannot be reversed. One option is to require that the firm stops its anti-competitive practices in the future. This is essentially what the pending settlement argument between Microsoft and US Department of Justice has attempted to do. The obvious problem is how does one monitor and enforce the agreement. If the Microsoft settlement gets implemented, it will provide an interesting experiment in enforcement. It is currently proposed that three monitors will be hired, who have the necessary technical expertise to monitor the settlement. Time will tell whether this works.
- 5.80 The other two alternative remedies are fines and restructuring of the company. Because of the level of profitability associated with being a dominant firm in such high-tech industries, we question whether the threat of fines, unless they are enormous, would be a deterrent. The competition authorities may find it politically difficult to assess and collect fines of sufficient magnitude to be effective. Also, in winner-take-all situations, a firm may worry first about obtaining dominance and only then worry about defending an abuse of dominance case. If it does not become dominant, the anti-competitive conduct will not be condemned and it will not have to worry about a fine.
- 5.81 Finally, structural solutions may work particularly where the anti-competitive conduct has taken place in several related markets. Breaking up a firm and creating new firms with businesses in these respective markets makes some economic sense. This was clearly what the US Department of Justice and the US District Court had in mind in advocating the break-up of Microsoft leaving the PC operating system in one company and the applications business that runs on that system as a separate business. We have no particular guidance to give on this issue. We would note that breaking up a company is seen as draconian and therefore may engender political opposition. Also predicting how the markets will evolve after a break-up is extremely difficult.

5.82 Because of this, competition authorities may want to use their powers to prevent such a situation from developing if at all possible. For this reason they may need to be more aggressive in preventative enforcement such as blocking mergers. This is discussed further in the paper when we address mergers.

Licensing and access to intellectual property

5.83 Intellectual property plays a major role in the high-tech industries of the new economy and along with highly skilled people who embody this knowledge it is probably the most important asset of many firms. The granting of limited monopoly rights to the creators of those rights is designed to create incentives for innovation in the form of higher returns. In many cases these rights are limited in time, such as patents, but it is not always clear how far the monopoly rights should extend in scope. For example, consider a software operating platform. We would expect that the intellectual property rights that underlie that platform should not be used by another firm to produce a competing software platform without a licence. However, should the property rights extend to control over access to the platform so that the firm owning the rights to the platform can, if it wanted, monopolise all software that runs on that platform? Here there are some trade-offs when it comes to incentives to innovate and the breadth of intellectual property rights. The broader the rights, the greater the return to the initial innovation, but having broad rights may mean that the initial innovator has an entrenched monopoly position and does not have to innovate further. Further, if it is allowed to extend its monopoly to applications software for the platform, it may stifle innovation in application programs. The important point is that while the laws granting intellectual property rights increase incentives to innovate by granting monopoly rights to the initial innovator, the exercise of these rights may stifle the incentive for others, including the initial innovator to innovate in the future. Therefore, broad intellectual property rights may increase the incentives for the next innovator but may stifle innovation in that area for those who follow. Determining the right balance is a large issue that is beyond the scope of this report. In what follows we implicitly assume that this balancing of the incentives is about right given our current laws governing intellectual property.

5.84 There are two broad categories of problems involving the licensing of intellectual property that competition authorities are likely to encounter:

- claims of anti-competitive refusals to licence, and
- assessing whether licensing conditions are anti-competitive.

5.85 Refusing to licence is the flip-side of the question of when to mandate access to intellectual property on the grounds that such mandatory access is in the public interest. We address both these issues.

LICENSING

5.86 There are a large number of ways that licences can be used to impose conditions on licensees. Many restrictions that might be contemplated involve issues discussed under separate headings in this report, such as tying and exclusive dealing, with the only distinction being that they are achieved by way of licence conditions. Such restrictions should be considered under those headings, although the test for anti-competitive effects discussed here will still be relevant.

5.87 When assessing the competitive effects of licensing practices the relevant issue, from an economic perspective, is whether the licence or condition in question will make the market more or less competitive compared to the likely alternative outcome if the licensing practice is proscribed. It is important that the impact on market competition is considered in the broadest sense, as dampening of incentives to innovate is likely to be at least as important as effects on current competition.

5.88 In many licensing cases, the counterfactual may well be no licensing at all. In other words we taken as given that the intellectual property rights have been granted and should be enforced. In such cases, even if the licence price is ensuring all of the value of the intellectual property remains with the licensor, it is unlikely that such a licence should be considered anti-competitive. Compared with the counterfactual, the technology is being disseminated more widely, and consumers stand to gain from innovation and variety in the final product from value that competitors can add to the technology in other areas. However, there will always be exceptions, one of which is selective licensing, which is discussed below.

5.89 It is crucial that the competition authorities use the correct counterfactual when considering licensing cases. An example of when the authorities used an incorrect counterfactual is provided by the video games case study, described in Part II of this report. The UK Monopolies and Mergers Commission, in an investigation of the UK video games market, employed a counterfactual that assumed that any software developer wishing to develop games would be allowed access to the firms proprietary information without any licensing restrictions, other than the payment of a reasonable royalty. In our view, however, the relevant counterfactual in a case such as this is no licences being issued at all.

5.90 Licences that contain conditions that restrict the licensee in areas not directly related to the intellectual property licensed should be carefully examined, as such clauses can potentially cause competition problems. For example, consider Nintendo issuing licences to develop games for its system to independent software houses that specialise in producing computer games. Clearly a refusal to license by Nintendo (that is, a decision to develop all Nintendo software in-house) would impair its rivals much less than licensing independent developers subject to the condition that licensed developers not develop games for any of Nintendo's rivals. Unfortunately, from an enforcement perspective, selective licensing can be used to achieve a similar effect without a specific clause in a contract which is relatively easy to observe. For example, Nintendo might choose not to license software houses that also develop games for competitors. If it becomes clear that developers developing games for competitors will never be licensed by the largest player, those developers may choose not to work for the smaller rivals.

5.91 The US Intellectual Property guidelines²⁴ advance the principle that a licensing arrangement may raise antitrust concerns **if it harms competition that would have occurred in the absence of the licence**. The guidelines distinguish between two types of licensing restrictions.

- The first type restricts the licensee's use of the licensor's intellectual property, for example by restricting the geographic area a licensee can operate in, or the uses the technology can be put to ('field of use' restrictions).

Such provisions can appear anti-competitive at first glance because they restrict the licensee's freedom to compete outside of the geographic or product area allowed by the licensor. However, most often such provisions will not prevent competition that would have occurred in the absence of the licence. Therefore, from an economic perspective, they are not likely to be anti-competitive. Absent the ability to impose such restrictions, the alternate is likely to be no licensing at all, or perhaps inefficient vertical integration. The underlying principle here is that if it is accepted that an owner of intellectual property has the right not to license, then limited licences should generally be acceptable.²⁵

- The second type of restriction limits the ability of the licensee to deal with the licensor's rivals, or impedes the licensor's rivals in some manner.

²⁴ Antitrust Guidelines for the Licensing of Intellectual Property, US Department of Justice and Federal Trade Commission, 1995.

²⁵ Note that this economic principle may conflict with EU competition law objectives, which include single market integration, and therefore tend to object to practices which restrict intra-Community trade.

This second type is much more likely to have anti-competitive effects. The principle that should be applied to assessing such conditions is that they should not prevent competition that would have occurred in the absence of the licence. For example, returning to the Nintendo example, assume Nintendo licensed independent computer game developers to develop games for their system, but that the licence was conditional on the developer not developing PC computer games. Because independent games developers would be able to develop games for PCs **without** a licence from Nintendo, this would be preventing competition that would have occurred without the licensing practice. This would put such a practice into the area of being potentially harmful, and worthy of further investigation.

- 5.92 Many licensing arrangements are vertical, rather than between actual or potential competitors. It can be argued that the relationship between parties is therefore complementary, and that there will rarely be an incentive to impede the complementor's freedom to compete. However, this should not be assumed. A dominant firm may have at least two motivations for attempting to influence the behaviour of downstream parties. The first is foreclosing entry to competitors, for example, by restricting competitors' access to distribution channels. The second is preventing downstream parties from taking any action that undermines the value of their product. While in textbook theory a monopolist faces a given demand curve for its product, in practice the monopolist's demand curve may be highly susceptible to marketing effort. By increasing demand, a monopolist can increase both the volume and price at which it sells.²⁶ In this case, a dominant manufacturer of an input may have significant incentives to maintain control of the presentation and marketing of the product, and may also have interests in preventing downstream producers from differentiating their product in a way that will ultimately lower the perceived value (by consumers) of the manufacturer's input.²⁷

²⁶ A good example of this is the DeBeers diamond cartel. DeBeers not only effectively constrained the supply of diamonds, creating the impression that diamonds are rare, but also successfully developed demand for the product. The 'Diamonds Are Forever' adage was developed as part of a DeBeers marketing campaign aimed at reducing resale of diamonds by consumers. DeBeers also promoted the use of diamonds in engagement rings, and popularised the eternity ring as a means of boosting demand for diamonds.

²⁷ Baer and Balto (1999) argue that this was a partial motivation of behaviour by Intel that was subject to a settlement between Intel and the US FTC in March 1999. They state at page 86 that: '...Intel's forced acquisition of technology from computer OEMs reduces the ability of those OEMs to support a non-Intel microprocessor platform by taking away an OEM's proprietary technology that could have been used to market its machines. Thus, Compaq would be much less able to support an AMD or Digital microprocessor system by advertising its own nonmicroprocessor technology because Intel forced Compaq to license that other technology and Intel could in turn license it back to other OEMs that support an Intel microprocessor platform.'

- 5.93 Consider, for example, the Pilkington 'Float Glass' process which illustrates the basic point. During the 1950s and 60s Pilkington developed a new method of producing flat glass. The 'float glass' production technology, which involves producing glass by floating it on molten tin, revolutionised flat glass production, significantly reducing the cost and improving the quality. Pilkington received intellectual property protection for its innovation both in the form of patents, and trade secrets. Lacking the capital and presence in many markets needed to utilise the process globally, Pilkington entered into licensing arrangements with numerous licensees to exploit the technology.
- 5.94 Pilkington's licensing arrangements included conditions such as geographic restraints on trade. However, these are not anti-competitive. Assume, for example, that Pilkington carried out manufacture of glass using the new process itself within Europe, but licensed another firm in the US, subject to the condition that that firm could not export to the EU. This arrangement is not anti-competitive, as it is not restricting the US firm from engaging in competition that would have been possible absent the licensing arrangement. However, a licence condition restricting that producer from exporting glass to the EU that was produced by the float glass **or any other production method** may be anti-competitive. Such a provision would potentially restrict competition that would have taken place, had the licensing arrangement not been in place.

PACKAGE LICENSING

- 5.95 Package licensing occurs when a licence is granted under one patent, conditional on the acceptance of one or more additional licences. Package licensing can be used in a similar fashion to 'full line forcing' distribution arrangements where a manufacturer requires a distributor to carry its full line of products in order to get some individual products which are in demand. In general, package licensing is a form of tying and should be analysed as such. However, tying can also be used to create arrangements that are equivalent to exclusive dealing (such as full line forcing), in which case the competitive effects of exclusive dealing should be considered.

GRANT BACKS

- 5.96 A grant back provision gives a licensor the right to access intellectual property rights of a licensee that arise when the licensee develops new technology that either improves the licensed technology, or works in conjunction with it. In short, it allows the licensor access to improvements to its base technology.
- 5.97 Grant backs can increase the incentive to license, while maintaining the incentive to innovate. Consider a hypothetical European manufacturer of telecoms technology that licenses a technology partner who has exclusive

rights to developing and distributing the product in Asia, with an associated grant back provision allowing the European licensor access to any patents or intellectual property the Asian partner develops. The licensee is provided with an incentive to invest in the technology by the exclusive franchise in the licensee's home market. The licensor has an incentive to license, both because it knows that it will not lose control of future developments relating to its base technology, and because it can gain from development of the technology by the licensee.

- 5.98 A grant back is most likely to be anti-competitive if it stifles innovation by removing the licensee's incentive to innovate. This is the potential competition authority should focus on if assessing a licence grant back clause. Nonetheless, even if the grant back is clearly designed to remove the incentive of a licensee to develop the licensed intellectual property, a second test should be considered before concluding the clause is anti-competitive. That is, does the clause reduce competition, when compared with the competition that would take place if the clause were removed. Once again, if the alternative is no licence at all, the grant back may still not harm competition.

Mandating access to intellectual property

- 5.99 In high technology, dynamic industries issues involving access to 'essential facilities' may arise. They are most likely to come from one of two sources:
- The first is intellectual property rights that may create a monopoly in a technology or process that is core to competition in a particular market, or in related markets.
 - The second likely cause is dominance that has resulted from a market 'tipping' to a common standard, which then implies that competitors or complementors need access to the underlying technology, either directly or via interfaces, in order to compete.

Once again, some form of protection of intellectual property is necessary to raise an access issue.²⁸

²⁸ There are, of course, other sources of essential facilities issues—in particular absolute barriers to entry from scarce resources, such as radio spectrum in mobile communications, and scale economies in infrastructure. Our focus here is on access issues in relation to intellectual property rather than more general access problems because the associated issues are well aired in the utility regulation literature, and infrastructure access is a significant topic in itself. However, the issues we suggest should be considered when dealing with access to essential facilities are still directly relevant to any general consideration of whether to impose compulsory access conditions on a dominant firm.

5.100 When access issues are raised in relation to technology, standards or interfaces, the key question for a competition authority is: when should dominant firms be forced to make their technology, interfaces, or facilities available to other firms? The theoretical trade off is (deceptively) simple. Imposing compulsory access conditions may reduce the return earned by the owner of the property right, and as a result may diminish investment incentives. This is potentially true of both the firm subject to the access requirement, and of other firms that observe the intervention. Against this, compulsory access can increase the current level of competition in the market, and may also facilitate incremental innovations on the part of those firms gaining access. In the long term, if access rights foster the growth of competitors with established brands, customer bases and experience, they may also facilitate more fundamental innovation and competition.

5.101 In general then, the core of the issue is balancing short run gains in efficiency with long run incentives to invest and compete dynamically. This balancing must be carried out on a case by case basis, as the balance will depend on the facts associated with the issue at hand. While each case will require individual consideration, there are a number of key questions that should be examined in undertaking the balancing process, which we discuss below.

Is the market for the underlying facility dynamic, or likely to be dynamic in the longer term?

5.102 If the market for the facility or technology is potentially dynamic—that is, there is some reasonable probability that competition will occur, even though the nature and timing of such competition is uncertain then the case for compulsory access is weaker than if the market for the underlying facility is clearly static, and there is no realistic probability of competition at the facility level. In the context of dynamic markets, it is important to keep in mind the potential for a technology that appears to be impregnable to be leapfrogged completely by unforeseen developments. An inability to forecast the next generation of technology (which suggests a firm **might** remain dominant) is not equivalent to a utility type access problem where it is effectively certain that the facility is competitively static (for example, a water distribution network). An uncertain future both changes incumbent behaviour, and makes efficient pricing of access much more difficult.

5.103 The question of what time-span to conduct the analysis over is a difficult one. However, the issue to consider is the balance between the size of the potential short run gains available, compared with the size of the potential long run gains that might be endangered by granting compulsory access. The time horizon considered will therefore need to be longer than when considering the potential for short run price competition in the market. In taking into account

the long run effects, the timing, size and risk associated with future capital investments must be considered. The analysis therefore needs to have a long enough time horizon to take these factors into account.

- 5.104 Ultimately, this question is perhaps the main issue in dynamic markets, where innovation is a prime form of competition. If competition at the facility level is feasible it is probably best to avoid compulsory access. However, if this is not possible **and** there may be significant benefits from mandated access, then a regulator should consider mandating access. However, it should be noted that the answer to the question of whether to actually mandate may critically depend on access pricing and other administrative issues, which are discussed further below.

What is the size of the potential benefit from access?

- 5.105 If the potential competitive benefits from granting access are small, it will be desirable to lean towards not intervening in private property rights. Against this, if the potential benefits in the short run are large, compulsory access should be considered more seriously. Whether the benefits of compulsory access are likely to be large or small should be assessed by considering the potential for price competition (the extent to which margins could fall if competition intensifies), and the potential for incremental or fundamental innovation to be facilitated by access.

Has the dominant firm invested in developing the technology or facility?

- 5.106 If the dominant firm has engaged in substantial, high risk investment, and is enjoying the benefits of 'superior skill and enterprise', compulsory access claims should be treated with caution. In cases where little or no investment has been involved, access is much less likely to be damaging. The *Magill TV Guide* case, where the European Commission found that TV listing information was a facility to which competitive access should be granted, is a good case in point. The intellectual property owner had not invested or borne any risk in producing the information; it was simply leveraging a positional advantage.

What is the potential to impact future investment?

- 5.107 Closely related to the above point of whether the firm invested initially, is the issue of whether there is likely to be significant future investment in the facility, and when that might be expected to occur. If significant reinvestment is likely, then the potential impact on investment incentives should be carefully considered. A poorly designed compulsory access provision could potentially delay, or perhaps even stop, future investment plans.

Might compulsory access spur investment in the underlying facility?

- 5.108 There may be cases where mandating access will help competitors to develop that, in the long run, will eventually be able to challenge the dominant firm. Indeed, this may be a motivation for the dominant firm refusing access to other firms. Clearly, this would tend to favour a compulsory access ruling.

Has the dominant firm exercised market power by foreclosing access to the facility once dominance has been achieved?

- 5.109 If a firm has achieved dominance by offering open access, and then removed those access rights, there is a much stronger case for mandating access. When interface or technology access was formerly open, the dominant firm is likely to have succeeded at least partially due to the investments and initiative of other firms that had planned on continuing access. Allowing such opportunistic behaviour is likely to reduce the incentive of other firms to invest in the future and may represent *ex post* appropriation of the returns to investments made by the other firms.

- 5.110 Furthermore, customers may also have chosen the technology, believing it would remain open. Allowing dominant firms to close interfaces may allow them to engage in 'installed-base opportunism'. This occurs when a firm can increase prices to a customer once they are locked-in to a product, such as a software package, because of the costs involved in switching to competing packages.

Can access be priced appropriately?

- 5.111 If access is to be mandated, then establishing the terms and conditions of access is a significant practical problem. In the context of dynamic markets, there are some specific issues that need to be considered.
- 5.112 First, the facility or intellectual property owner must be allowed a 'reasonable' return on their investment. In a technology market, where the firm subject to the access requirement is a 'winner', this is a significant problem. Setting a rate of return on the basis of a risk free rate plus an average risk adjusted rate of return for the sector involved will risk grossly undervaluing the return that a revealed winner should make. An error of this type by a regulator could have serious consequences for future investment decisions. In some cases this problem might be resolved by a 'retail minus' pricing system, where access is priced at the retail price, less any cost savings (to the incumbent) from competitive provision of the service. However, in pricing access to a piece of technology or interface that is only a component of final products, such an approach is likely to be difficult to employ in practice.

5.113 Second, in markets with high fixed costs, and low marginal costs, firms with market power may engage in efficient price discrimination. If access is mandated on the basis of a flat rate wholesale price, competitors will undermine the incumbents' price structure, which may have negative welfare implications. The socially efficient pricing structure of the market or markets involved, and the consequences of mandating access, should be carefully analysed.

5.114 Third, and balanced against these concerns, it should be remembered that high technology firms routinely negotiate commercial terms for access to intellectual property. This does not imply that access can always be efficiently priced and made available to competitors without damaging incentives to innovate. However, it does suggest that at least in some cases an incumbent attempting to deny access to competitors on the grounds that suitable terms cannot be negotiated may be overstating the difficulties involved.

What are the costs of monitoring the access regime?

5.115 If an access regime is to be implemented, the administrative costs of setting up and maintaining the access regime need to be balanced against the potential benefits.

5.116 While the questions raised above are useful in guiding the balancing process, it should always be kept in mind that the concept of an essential facility runs contrary to property rights, which fundamentally underpin market economies. So while there will clearly be cases when access should be enforced, these cases should occur:

- rarely,
- where failure to provide access will have clearly demonstrable anti-competitive effects, and
- where the enforcing authority has a high degree of confidence that the intervention will not damage the long run competitive process.

5.117 An example of a case in which access to IPRs was mandated when in reality it should not have been is the video games case described in Part II of this report. The mistake made by the UK MMC, in its investigation of the UK video games market, was to use the wrong counterfactual in its analysis. The MMC employed a counterfactual that assumed that any software developer wishing to develop games would be allowed access to the firms proprietary information without any licensing restrictions, other than the payment of a reasonable royalty. In our view, however, the relevant counterfactual should have been that of no licences being issued at all. In using the counterfactual it did, the MMC

implicitly assumed that Nintendo and Sega should be subject to a compulsory access regime. In our view, a compulsory access regime should not have been put in place in this market.

DOWNSTREAM INNOVATION

- 5.118 The question of whether or not mandating access to intellectual property of the downstream arm of a vertically integrated firm that has market power upstream can raise additional issues. Where the intellectual property is created entirely by the downstream arm and could have been, as readily, created by an independent competitor then the case for overriding intellectual property rights through mandated access could be expected to be no stronger than if the intellectual property had actually been created by an independent competitor. However, in high technology industries, innovations may involve modifications to products at different stages and so it may be unclear where the source of the innovation lies. For instance, the provision of high speed retail data communications services may require obtaining access to a telecoms network in a particular way that differs to standard access.
- 5.119 Where a downstream innovation is supported by modifications to an 'essential facility' in a related market then downstream competitors should be able to obtain mandated access to the modified facility, subject to the same general considerations as outlined in this section related to balancing short run efficiency gains and long run incentives to innovate. It is less clear that mandated access should be extended to the downstream elements of the innovation. Where access is mandated, the appropriate pricing approach needs to be determined carefully. For example, if a cost based pricing approach was previously appropriate for access to the upstream essential facility then it may still be appropriate if there have been only relatively minor modifications to the facility to support the innovation. However, if the upstream facility has been substantially transformed as part of the innovation then a retail minus approach may be a preferable means to facilitate efficient competition in the downstream market. Such an approach can maintain the return to the innovation in the upstream market commensurate with the risk involved.
- 5.120 A further concern is whether the presence of a vertically integrated firm with market power upstream may act to limit downstream innovation by competitors such that they are competitively disadvantaged. In the absence of a mandated access regime to the upstream facility, downstream competitors may be less likely to innovate if they fear that some or all of the return may be able to be captured by the upstream firm through higher access charges. Alternatively, the vertically integrated firm may seek to use its control of the upstream facility to constrain the ability of downstream competitors to bring innovations to market until it is able to develop its own products. In particular, this could occur

where the downstream innovation relies on modifications to the upstream facility. The appropriate response in that situation would be to ensure an effective access regime (and thereby raise the incentive for all downstream firms to innovate) rather than seeking to impose open access to the innovations of the downstream arm of the firm.

Profits

5.121 Economic theory predicts that firms with a monopoly will earn profits that are larger than those of a firm facing competition. In the context of competition law enquiries it may therefore seem reasonable to look for 'excessive' profits as an indicator of evidence that a firm has exercised market power. Unfortunately, this will rarely, if ever, be the case. There are severe practical and theoretical difficulties associated with measuring economic profitability. We focus here on two core problems associated with measuring profitability that are likely to be particularly relevant in the context of dynamic industries:

- accounting profits do not measure economic profits, and
- not all economic profits are monopoly profits.

5.122 Accounts are designed for financial reporting to external parties, and have a focus on producing information that is objective and reliable. They are not intended to record potentially more economically relevant, but subjective, information. For instance, capital assets such as the value of a firm's brand or intellectual property do not usually appear on the balance sheet.²⁹ Furthermore, constraints are placed on recording practices by legal restrictions such as taxation requirements, and by accounting standards designed to limit the ability of managers to bias accounting results. Accounts do not attempt to measure economic costs.

5.123 Correct measurement of the economic profitability of any activity involves measurement of the costs and revenues associated with that activity throughout its entire lifetime. This can only be measured by modelling the activity, over the project lifetime, using discounted cash-flow techniques. In stylised form, most projects involve an initial investment period, when accounting profits are low or negative, a mature phase when accounting profits are high, and a sunset phase when accounting profits fall to zero and the activity is discontinued. Observing high accounting profits in the mature phase of a products life might convey little useful information on whether excess profits are being earned.

²⁹ An exception is if the firm has been recently traded, in which case the valuation of these factors will be captured in 'goodwill'.

Economists refer to such profits as *quasi*-profits. They appear as if they are real (excess) profits, but in fact are only an artefact of taking a snapshot at a particular stage of the product lifecycle.³⁰

- 5.124 There are sources of economic profits that are not monopoly profits. In the context of innovation, Ricardian (scarcity) rents reflect difficult to expand competences, while Schumpeterian (entrepreneurial) rents occur because imitation does not occur instantaneously. Both are benign sources from a competition policy perspective. They encourage investment in knowledge assets and in innovation, and there is no contraction in market volumes as a result of firm behaviour.
- 5.125 There are many more factors that make attempting to evaluate the economic profitability of any firm or product very challenging. These include problems associated with estimating the relevant cost of capital for high risk projects, survivorship bias, short run effects of dis-equilibrium, dealing with multi-product firms, and so on. However, the examples chosen above are particularly severe in high technology, dynamic industries. Some of the assets used in production in technology industries, such as know-how and intellectual property rights, are unlikely to be recorded in financial accounts. Products have lifecycles that cannot be ignored in evaluating profits. Risk levels are high and difficult to quantify, and 'survivorship bias', with many firms failing and a small number of very profitable winners, is severe. Even if economic profits can be identified, they will include returns to innovation and scarce resources. Finally, and of critical importance in the dynamic markets of the new economy, monopoly rents or excess profits are only eliminated in long run equilibrium. The dynamic and competitive markets of the new economy may never reach such an equilibrium. These difficulties are of such magnitude that it is extremely difficult to identify and measure excess profits in dynamic industries. What are likely to be identified as excess profits may in all likelihood be normal or even below normal returns on highly risky investments in innovation. The potential for enforcement activity based on attempts to measure excess profits to stifle future investment in innovation is high in dynamic industries, as is the potential for measurement errors that make normal returns appear as excess profit.
- 5.126 The video games case, discussed in Part II of this report, provides an example of a case in which the UK Monopolies and Mergers Commission (MMC) used profitability as an indicator of competition concerns. Our preceding analysis, however, argues that there are severe practical and theoretical difficulties

³⁰ The conceptual and practical problems of inferring monopoly rents from accounting rates of return are well understood and a full recounting of the arguments is beyond the scope of this paper. For a definitive treatment of this subject area see Fisher and McGowan (1983).

associated with measuring economic profitability, particularly where high technology industries are concerned. This casts doubt on the usefulness of such analysis in cases such as this.

5.127 The Iridium case, discussed in Part II of this report, provides an example of a case in which there was a hint that rents would be appropriated if a venture was successful and profitable. The European Commission initially allowed certain exclusive distribution agreements because Iridium (as discussed previously) was a venture that involved considerable risk and probably would not have gone ahead in the absence of the agreements. However, the Commission indicated that should Iridium become dominant and highly profitable, the acceptability of the distribution arrangements could change. This is, in our view, a good example of how competition regulation can be badly misapplied. If investors know that they could be punished for being successful (ie, their venture is highly profitable) after taking on substantial risk, incentives to innovate could be reduced.

6 COLLECTIVE BEHAVIOUR

- 6.1 Historically, cooperation and agreements between competing firms have been looked at by competition authorities with a high degree of concern, even hostility. The assumption has been that little good can come from *any* communication between competitors. The underlying suspicion has been that such firms will reach agreements to fix prices, reduce output, allocate territories or any other manner of anti-competitive conduct. This has made the competition authorities concerned about the activities of trade associations, the sharing of data, the use of common systems, etc. all of which have been seen as having potential to facilitate either explicit or tacit collusion to raise price and restrict output. To a large extent this remains true today. Price fixing, territorial allocations among competitors, etc. are illegal and are forbidden to industries of the new economy as they are to industries of the old economy.
- 6.2 At the same time there have been circumstances where the competition authorities have realised that some cooperative action among competitors can be beneficial to innovation and productivity and should be allowed. For example, products need to work together and therefore industry standards can serve a useful purpose and such standards have existed in the past. Joint ventures among competitors are not unique to the new economy either. Thus, the need for cooperation among competitors for productive purposes is not a totally new phenomenon to the dynamic industries of the new economy. What is new is the frequency and the scale on which cooperative behaviour is required and the unique competitive circumstances under which cooperation takes place, for example in the presence of network effects, critical system interfaces, blocking patents, etc. Therefore, the competition authorities are faced with considering many more proposed cooperative agreements and the need to assess their impact on both the productivity and competitiveness of the industry, while respecting the intellectual property rights granted to the participants.
- 6.3 This is a daunting task and there often are no right or wrong answers, just various trade-offs. In this chapter we discuss various issues that arise with regard to cooperative action in the new economy. We do not discuss the old prohibitions against price fixing and collusion, except as they arise in the context of a typical cooperative activity in the new economy. Specifically, this chapter examines cooperative standard setting, cross-licensing and patent pools, and joint ventures. These are all forms of cooperative behaviour that are prevalent in, and important to, the new economy.

Cooperative standards setting

- 6.4 Many products have more value to consumers if they are able to work with other products. Such products benefit from being **compatible** with those other products, and the standards and interfaces that are necessary to achieve compatibility become a critical feature of the market. Compatibility issues arise in many industries, and can involve anything from camera bodies and their associated (complementary) components such as lenses and films, to software applications that need to be able to operate together. While compatibility issues are common, in the context of today's dynamic industries they are particularly important in the information technology and telecommunications sectors.
- 6.5 Compatibility can be required in a number of dimensions:
- Between competing products, as in the case of a user of a Lotus spreadsheet wanting to access data in a Microsoft Excel spreadsheet.
 - Between complementary products, as in the case of a Lotus spreadsheet package running on Microsoft's Windows operating system.
 - Between succeeding generations of products; for example, a user of Excel 7.0 wanting to open a spreadsheet created in Excel 4.0.
- 6.6 The need for products to be compatible, and for standards to enable this compatibility creates two areas of interest for competition enforcement authorities. These areas are associated with **cooperative standard setting**, and **unilateral compatibility decisions**.

Compatibility standards allow components of systems to work together, and collective standard setting is therefore common in practice. Given the mutual need for compatibility, even the most vigorous competitors can agree to common standards at times.³¹ This raises an important issue for competition authorities. Does cooperation lead to efficient standardisation, increased competition, and additional consumer benefits, or is cooperative standard setting a means for firms collectively to stifle competition, to the detriment of consumers and firms not included in the standard-setting group?

- 6.7 This question can only be answered by examining the competitive effects, both costs and benefits, of a particular proposal, and comparing them with a reasonable counterfactual, or 'but-for' scenario, of the world as it might be if the proposed cooperation did not go ahead. An important part of this analysis is examining

³¹ Katz and Shapiro (1998) note that even Netscape and Microsoft agreed to include compatible versions of Virtual Reality Modelling Language, developed by Silicon Graphics, in their browsers.

whether any proposed cooperation involves the least anti-competitive arrangement, which still achieves the cooperative aim. Katz and Shapiro (1998) note that cooperation may affect competitive outcomes by:

- locking in a different design to that which might have emerged under competition,
- eliminating a standards war prior to tipping, and
- enabling multiple firms to supply the standard good.

6.8 The first effect is a possible detriment, should an inferior design become the standard. The second effect has both positive and negative aspects. Elimination of a standards war will reduce the initial intensity of competition, perhaps drastically. However, this may be offset, and perhaps outweighed, by reduction in wasted R&D effort (by the firms that would have eventually lost a standards war), and the increased intensity of competition within the market in the long term. This happens by way of the final effect, enabling multiple firms to supply the standard good and compete within the market.

COSTS AND BENEFITS OF COMPATIBILITY AND STANDARDS

- 6.9 When network effects are present, establishing standards that allow inter-firm or inter-product compatibility offers the potential for greater realisation of network effects. As increasing network size increases the value of the network to consumers, this is a gain in consumer welfare.
- 6.10 Whether or not network effects are present, compatibility can decrease the cost of duplicate equipment needed to participate in multiple networks. Furthermore, benefits in terms of the average cost of production can be achieved when economies of scale, learning effects and technological spill-over in the development and production of specific components are important.
- 6.11 Increased variety is also likely to result from standards. A good example is audio systems where, due to compatibility, consumers can build customised systems with components from a large number of manufacturers. Alongside increased variety, consumers are less likely to become stranded with an outdated or unsuitable technology. For example, imagine a situation where consumers had to choose between incompatible audio systems. If at some point in the future an audio system owner wanted to switch to another system provider's CD player because that firm had become a leader in this area, they would need to replace their entire system.

- 6.12 The main cost of standardisation is the inevitable constraint on variety and innovation that it brings. For example, while standards were clearly necessary in establishing analogue TV transmissions, once the standard had been set for each nation it was there to stay, whether or not the initial standard was a good choice.
- 6.13 The nature of competition can be dramatically affected by whether or not products or their interfaces are standardised. When products are incompatible, and network effects are strong enough to cause markets to tip, firms will compete for the market. This competition can be particularly aggressive up to the point where a winner or dominant player has been established after which it may decrease substantially. On the other hand with compatibility, firms will tend to compete in the market, and compatibility tends to further intensify competition by neutralising installed base and expected sales as competitive advantages. There is a clear trade-off here. There can be (intense) competition up front, or during the life of the product, but generally not both.³²
- 6.14 Which form of competition is preferable from a public policy perspective depends on the circumstances of the particular case. However, one time when standardisation is clearly preferred is when a failure to standardise means the product would never 'take-off'. This could be because of blocking patents, or consumer resistance to moving to a new standard. This is most likely to be an issue when there are significant switching costs for consumers in changing standards, or a high perceived risk of being stranded with an unsuccessful new technology. For example, in establishing the CD standard, Sony, Philips and a number of other consumer electronics firms cooperated to establish the standard to overcome consumer resistance to migrating to the new product.³³

ABUSE OF STANDARD SETTING PROCESSES

- 6.15 There are two main ways that standard setting can be used to change competitive outcomes. The first is when one or more parties use intellectual property rights to capture the value of the standard, once it is established. The second is incumbents capturing the process, and using it to create barriers to entry for competitors.

³² Of course, it is possible to have both if the winner is forced to provide low cost compatibility ex post. However, this may have negative consequences for future investment and innovation, and cannot therefore be assumed to be an optimal outcome.

³³ In the case of compact digital audio discs (moving to CDs), consumers had significant switching costs because of their investment in collections of vinyl records. Associated with this the CD players were relatively expensive initially, and few CDs were available. If the system had failed in the market, the risk of stranding was high.

- 6.16 There have been cases where firms have attempted to use intellectual property rights to capture value from a standard, after the standard has been set. Baer and Balto (1999) argue that Dell Computer attempted this in the mid-90s. In this case, Dell was involved in the design of a standard for the Video Electronics Standards Association (VESA) for a local bus to transfer instructions between a computer's CPU and peripherals. After the standard was agreed, Dell Computer alleged that the new standard infringed a patent it held, despite twice certifying, along with other members of the Association, that it had no intellectual property conflicts. While incidents such as this are potentially concerning, Katz and Shapiro (1998) argue that this is really a contract law issue, and that standard setting groups should (and often do) have provisions in their charter compelling members to reveal all relevant IPRs, or to commit to licensing IPRs embedded in a standard on fair and reasonable terms. The Dell case is discussed in detail in Part II of this report.
- 6.17 The second major problem is the potential for standard setting bodies to be captured by vested interests, and to be used to erect barriers to entry and prevent or delay innovative competition. Curran (1998) provides examples of such behaviour from the US. Curran states that the American Society of Mechanical Engineers (ASME), through an absence of organisational controls, allowed two members to 'con' it into blocking an innovative new boiler design. Similarly, the National Fire Protection Association (NFPA) delayed the introduction of an innovative new wiring code for six years.
- 6.18 Standards being used to block competition is a particularly difficult issue for regulators. Anton and Yao (1995) note that courts and regulators are not well positioned to make technical judgements. For example, the ASMEs boiler and pressure vessel code ran to over 18,000 pages. Nonetheless, Anton and Yao report a number of US cases where investigations by the FTC quickly and clearly showed a grossly biased or inadequate process, and some standards being modified simply because of the investigation. This highlights the fact that even if competition authorities are not well equipped to make technical judgements, by focusing on the process used to establish standards it can still identify and correct potential abuse.

POLICY ISSUES – COOPERATIVE STANDARD SETTING

- 6.19 Katz and Shapiro (1998) argue that there are no easy or general answers for regulators when it comes to assessing standard setting, its effect on competition, and the resulting efficiency and consumer welfare impacts. However, they offer a number of guidelines for antitrust authorities.

- 6.20 Authorities should assess harm to third parties who are not part of the agreement, most likely consumers and other suppliers. Assuming the parties setting the cooperative standard are voluntary participants, any detriment is likely to come at the expense of those outside the agreement. Furthermore, if network effects are strong, it is worth remembering that the best you can hope for is having several firms offering compatible products. A single network with active competition within the network can be a very efficient outcome.
- 6.21 Assessing cooperative standard setting becomes more difficult when the agreement includes provisions including payment of royalties to each party. Royalties can be used to increase marginal costs, increasing prices and capturing monopoly profits that would otherwise be dissipated by competition between members of the standard coalition in the final product market. To distinguish cartel behaviour from patent unblocking, the question to be asked is whether a successful product could be launched by one or a subset of parties without infringing the IPRs of others. If it could, then evidence should be sought of production efficiencies or consumer benefits that justify widespread participation in the standard by potential competitors.
- 6.22 Katz and Shapiro suggest a number of questions that should be considered when deciding whether to allow cooperative standard setting:

Do the firms in the proposed standards coalition have market power?

- 6.23 This may be difficult to answer, as the product may not yet be in existence. In this case, the analysis should be conducted akin to a merger case based on potential entry effects. If the firms lack market power and there are firms that jointly or individually could put forth competing standards, then the cooperation is unlikely to harm competition.

Does the coalition have open or closed membership?

- 6.24 Open membership removes the risk of exclusion, but increases the likelihood of the coalition gaining market power.

Do members of the coalition possess blocking patents or other IPRs?

- 6.25 If they do, cooperation is more likely to be desirable. However it is not essential, as firms could license each other and third parties.

Are royalties required to adhere to the standard?

- 6.26 As noted above, royalties can have cartel-like effects. However, some level of royalty for access to patents and copyright is likely to be justified.

Is coordination critical to launch of the product?

- 6.27 If the product would fail to take off in the absence of standardisation, cooperation is desirable.

What ancillary restraints are placed on members of the standards coalition?

- 6.28 If there are few limits, then cooperation is less likely to harm competition. However, there are often good reasons to limit members' ability to produce non-standard products. For example, Microsoft has modified the Java programming language, a supposedly open standard, with improvements that only work in a Windows environment. Whatever Microsoft's motivations, actions of this type may have the potential to fragment or undermine a standard. Limitations on members' ability to deviate from the standard may be needed to control this type of problem.

UNILATERAL COMPATIBILITY DECISIONS

- 6.29 Markets can be separated into those where firms can unilaterally impose compatibility, for example by copying products or building adaptors that resolve incompatibilities, and those where a firm can unilaterally impose incompatibility by way of proprietary intellectual property rights or interfaces. An example of 'unilaterally imposed' compatibility is razors and blades, where Gillette has found it difficult to prevent rivals from manufacturing blades that fit into its razors. Gaming systems based on proprietary technology, such as Sony's Playstation, are a good example of a product where the manufacturer can unilaterally impose incompatibility. In markets where tipping is likely, a firm confident of winning may oppose compatibility. If this is the case, reputation, installed base and expectations become key competitive advantages (Katz and Shapiro, 1994).
- 6.30 If a dominant firm, or potentially dominant firm, has unilaterally imposed incompatibility, the key competition question is: when should such firms be forced to make their products compatible, by allowing access to technology, standards or interfaces, with those of other suppliers? This was explored when discussing the issue of mandatory access.
- 6.31 Aside from access issues, the other area which may cause issues to be brought to the attention of a competition authority is the role of *expectations* in helping a firm achieve dominance in a market prone to tipping. This issue, and issues associated with practices that arise when expectations are important – such as the tactic of announcing 'vapourware' in software markets – are discussed in detail in the section on predation. (paragraphs 5.6 to 5.36)

Cross-licensing and patent pools

- 6.32 Many technology products require access to a number of intellectual property rights, which will often be held by a number of different firms. When diffuse ownership of the intellectual property needed to develop a product occurs, and

prevents firms from developing products, this is known as a 'blocking patents' problem. Cross-licensing and patent pools are two forms of solution that help resolve the problem of blocking patents.

- 6.33 Cross-licensing occurs when firms enter into reciprocal licensing arrangements. It is more often than not an efficient means of transferring intellectual property between firms. Royalty free cross-licensing can remove blocking patent problems, with the added advantage of avoiding difficult commercial negotiations between firms over payment for intellectual property rights.³⁴ Patent pools can be used to remove blocking patent problems, but do so by setting up a separate entity that contains the relevant patents needed to produce a product or category of products. Royalty arrangements vary from royalty-free access to the technology in the pool for firms that contributed technology, to all firms paying royalties for access. There may be different royalty rates for third parties from the rate payable by firms that contributed intellectual property.
- 6.34 A competition authority examining cross-licensing or patent pooling arrangements needs to consider two key issues:
- Are the patents involved complements or substitutes?
 - Are there arrangements that relate to 'prospective' patents?
- 6.35 The core question is whether the intellectual property being shared is complementary (or essential) to the product or technology in question. If it is, then it is unlikely the sharing arrangement is anti-competitive. However, if the technology assembled includes substitute (or rival) patents, this would clearly be cause for concern. Likewise, pooling and cross-licensing arrangements are most likely to cause concern when the firms concerned are actual or potential competitors.
- 6.36 The Summit and VISX case, discussed in Part II of this report, provides a good example of a patent pool which created anti-competitive concerns. Summit and VISX originally developed their own technology for performing the laser eye surgery, and had each sought patent protection. However, rather than proceeding to independently take their laser technologies to market, they formed a patent pool in the form of a partnership, to which they each contributed their respective patents. However, the patents were substitutes, not complements; hence the patent pool restricted competition that would have happened in the absence of the pool.

³⁴ This also removes the complementary monopoly problem identified by Cournot. The problem is that two monopolists of complementary products will price each product higher than if both products were produced by a single monopolist. This is because the monopolist ignores the additional profit generated by sales of the complementary product, whereas a single monopolist takes these 'flow on' sales into account, and therefore sets a lower price. This is a horizontal form of the more traditional vertical problem of double marginalisation.

- 6.37 A further concern was that there were restrictions on the pool that were not required for the pooling of the patents. These included imposing a \$250 licensing fee to be paid to the pool each time a laser produced by either firm was used to perform a type of eye surgery known as PRK. This had the effect of fixing and increasing the price that doctors paid for PRK equipment and technology, by ensuring that neither firm had an incentive to charge doctors less than \$250 per procedure. In addition, the pool's terms also prevented either Summit or VISX from licensing its own technology to any other party without the approval of the other. As we argue in this report, in order to make a patent pool work successfully, there should be the minimum amount of restrictions possible on the pool's operation.
- 6.38 Agreements that involve future technologies should also be scrutinised carefully, particularly if the arrangement involves a large percentage of potential innovators in an industry. While agreements to share existing technology aid dissemination of that technology, agreements to share future discoveries can discourage investment in those technologies. If each firm knows that any discoveries that it makes will be immediately available to its competitors, there will be little incentive to undertake the research itself.
- 6.39 The US Department of Justice took a case against the Automobile Manufacturers Association in 1969 that reflected this concern. The major US car manufacturers entered into a research joint venture to develop new pollution control equipment, and agreed to exchange cross-licences to any future technology developments. The DOJ alleged that the venture retarded rather than promoted research. By agreeing to share any future technology developed, it removed the possibility and hence incentive associated with an individual manufacturer being able to gain an advantage in the market, and instead encouraged them to free-ride on other members of the joint venture.
- 6.40 Shapiro (2001) argues that while concern over agreeing to license future patents is valid in theory, in practice much of this activity is associated with the fear of being 'held-up'. That is, having to pay royalties on patents that have not yet been issued, for products designed without knowledge of the relevant patent applications.
- 6.41 In practice, this is a problem because it appears patents are regularly issued for technology that others are already employing, or independently deploy before the patent is granted and disclosed. This is a problem related to the operation of the patent system itself. However, competition authorities need to be aware that issues such as this can provide *bona fide* justifications for entering into agreements to share future intellectual property rights. However, the form of any such agreements should still be examined to ensure they have the minimum adverse impact on incentives to innovate. For example, it may be feasible in some cases to agree to license future patents that are granted on technology

already being employed by other parties, rather than entering into broad cross-licences that involve future patents regardless of whether those future patents can be used to hold-up other parties.

- 6.42 An example of the 'hold-up' problem is provided by the Intel case, discussed in Part II of this report. The complaint alleged that Intel sought to maintain its dominance by, among other things, denying advance technical information and product samples of microprocessors to Intel customers and threatening to withhold product from those customers as a means of coercing those customers into licensing their patented innovations to Intel.
- 6.43 The complaint alleged that Intel had suspended its traditional commercial relationships with three established customers by refusing to provide advance technical information about, and product samples of, Intel microprocessors. According to the FTC, Intel's objective in these actions was to force those customers to end disputes with Intel concerning the customers' asserted intellectual property rights, and to grant Intel licences to patented technology developed and owned by those customers.
- 6.44 A further example of the hold-up problem is provided by the Dell case, also discussed in Part II of this report. This case concerned Dell Computer Corporation allegedly unreasonably restraining competition by the way in which it enforced its patent rights against computer manufacturers.
- 6.45 Both cross-licensing and patent pools are likely to be used as settlement devices in intellectual property disputes, as they are inexpensive solutions to potentially very costly litigation. However, settlements can be used anti-competitively. For example, consider a situation where two parties each possess patent rights that can be used to make substitute products. Each party accuses the other of infringing its patent, however, they resolve the impending litigation by entering into a settlement. The settlement involves a cross-licensing agreement that allocates exclusive territories to each of the firms. This arrangement has the potential to eliminate competition between the parties that would have occurred in the absence of the licence. The key to deciding whether this is an anti-competitive settlement is in establishing whether the claims of patent infringement were strong, in which case the scenario involves blocking patents and the arrangement does not harm competition. On the other hand, if the claims were weak, the settlement is probably anti-competitive.³⁵ This issue is involved in the Summit and VISX case in Part II.

³⁵ Example taken from Gilbert and Shapiro (1997), at p288.

Joint ventures

- 6.46 A substantial amount of innovation is conducted through joint ventures and other collaborative arrangements. Two forms of joint venture particular to high technology markets that a competition authority may encounter are platform joint ventures and cooperative R&D efforts.

PLATFORM JOINT VENTURES

- 6.47 Platform joint ventures are a feature of modern e-commerce, and often involve trading exchanges of various types moving onto electronic platforms, such as automated bank clearing houses, online stock exchanges, and airline reservation systems. A good example of the type of e-commerce joint venture a competition authority may encounter is the proposed 'Covisint' parts purchasing joint venture, a business-to-business (B2B) exchange. Covisint is a car-industry B2B consortium whose members include General Motors, Ford, Daimler Chrysler, Renault and Nissan, and is expected to handle \$750 billion in annual purchasing when it is up and running.³⁶ Such platform joint ventures raise two issues for antitrust enforcement:

- the potential for the venture to dominate the platform market, and
- the potential for collusion via the platform.

- 6.48 If a platform joint venture will affect only a small portion of traffic within an industry, then the joint venture and its partners are unlikely to be able to exercise market power. However, if the share of traffic likely to be captured is large, then a competition authority should consider a number of issues, such as:³⁷

Is the joint venture too large?

- 6.49 If there are not substantial efficiency benefits to be gained from a single platform, a joint venture with too large a share of industry volumes may unnecessarily restrict competition.

Does the joint venture unreasonably exclude competitors?

- 6.50 If the joint venture controls a platform most efficiently supplied by a single entity, then the focus should shift to whether entry conditions to the platform are reasonable. Limiting entry may be attractive to joint venture partners if it allows competition within the market, once established, to be reduced.

³⁶ The Economist, 17 May 2001. The European Commission issued a release clearing the venture under Article 81 on 31 July 2001.

³⁷ List adapted from Baker (2000).

Has the joint venture engaged in unreasonable pricing of network services?

- 6.51 Closely related to the exclusion question, is the issue of access pricing. Access pricing can be used to exclude competitors, or reduce their ability to compete effectively. Payments between parties, such as interchange or interconnection fees, can be used to disadvantage firms with small volumes of traffic.

Does the joint venture unreasonably limit the collateral activities of its members?

- 6.52 Rules prohibiting investment in rival networks, or sometimes rules prohibiting members bypassing the network platform, are common. Rules surrounding membership of credit card networks have been subject to antitrust inspection on both sides of the Atlantic.
- 6.53 The other major area of antitrust concern is the potential for electronic platforms to transmit information between parties. Transactions on electronic platforms will usually carry a significant amount of data including pricing, volumes, dates, associated terms and conditions of sale and the parties involved. Clearly, if this information is available to all owners of the platform, the platform could be a very useful tool for facilitating oligopolistic coordination. This concern implies that authorities need to examine carefully the way the system will work in practice, and what information will be available to whom. Systems that allow future prices to be posted and observed should be particularly closely scrutinised for anti-competitive effects.

R&D JOINT VENTURES

- 6.54 R&D joint ventures are difficult to assess, given that the relationship between expenditure on R&D and innovative output is uncertain. An R&D joint venture that increases expenditure may or may not increase innovation, and an R&D joint venture that decreases overall expenditure may increase both innovation and efficiency by removing duplication and pooling knowledge.
- 6.55 Assessing whether an R&D joint venture is likely to be anti-competitive requires a case-by-case analysis of the facts. However, there are some useful starting points. The key issue is to identify how the joint venture will affect the incentives of the members. This is both in relation to current incentives to conduct R&D, and potential effects on competition in the market. To the extent that an R&D joint venture will result in a collective standard being set, the proposal should be analysed in the same manner as collective standard setting arrangements.
- 6.56 There are two main cases where collective R&D is likely to be beneficial. The first is when the benefits of the research will not easily be captured by the researcher ('technological spill-over'). When this is the case, individual firms may have little incentive to research individually, as they will be unable to capture the returns, but may be prepared to invest in a cooperative venture. The second

case, perhaps more common in a commercial context, is where the R&D project is too expensive and risky for a single firm to attempt to develop a new technology alone. Cooperative R&D of this type is relatively common in areas such as defence, where the costs and commercial risk associated with developing a new weapons system have escalated to the point that joint venture tendering is common. When either of these effects is present, an R&D joint venture is less likely to have anti-competitive effects.

7 MERGERS

- 7.1 This chapter discusses issues related to mergers in high tech industries that are specific to mergers. The issues discussed in the rest of this report (eg, tying, licensing of IPRs, etc) are also relevant to merger analysis. Hence a reader interested in the economics of competition law in mergers in high tech industries needs to read the whole of this report and not just this chapter.
- 7.2 The starting point for analysing how merger policy should be carried out in industries that are characterised by significant and rapid product innovation should be, as with the other issues considered in this report, consideration of whether the existing approach to competition issues provides a reasonable (though imperfect) framework for thinking about the issues. The correct approach is not to discard the standard approach but instead to be aware of what special issues are thrown up by significant and rapid innovation. This chapter focuses on those issues of merger analysis that are special to the new economy.
- 7.3 There are a number of such special issues. The first of these is that it is important to be clear about the nature of competition. In particular it is important to understand whether competition is predominantly **for** the market or **in** the market, and the extent to which competition in terms of new products and product functionality is the prime dimension of competition, rather than price. Standard merger analysis is predicated on competition being in the market since this is the more common of the two potential forms of competition and is primarily based upon price. Where competition takes place in the market in dynamically competitive industries it is likely to be a combination of competition based upon continuous innovation and price. The exact balance between the importance of innovation and price in the competitive outcome will depend upon the industry. Not all dynamically competitive markets lead to winner-take-all situations. For example, it is not unusual to have a market such as that for laptop computers. It has several large producers and a number of smaller ones. Product cycles are relatively short.
- 7.4 New products with added features such as better screens, more memory and computing power, lighter weight, and built-in features such as wireless access all go into the competitive mix. As each firm introduces its new product to better serve a segment of the market, its sales of that product surge until the next better model for that segment is introduced. Price in the particular market is also important, but by no means the only factor in determining sales. In some cases firms that specialise in feature innovation compete with firms that specialise in being low-cost producers of standardized products on the basis of prices. This is all dynamic competition within a market. This situation requires some special analysis when evaluating mergers.

- 7.5 When competition is for the market it is more likely to be primarily based upon innovation competition. Thus we should be particularly careful when analysing a merger in which competition is for the market, as sometimes occurs in high tech markets. However, it should be noted that even in the 'old economy' there are some industries where competition is essentially for, rather than in, the market. Bidding markets, such as those characterised by large defence firms which compete head to head for large weapons contracts with only one winner, are perhaps the most obvious example of these. Competition authorities have traditionally recognised that the analysis of mergers in bidding markets is rather different from that in standard markets, but they have not felt the need to apply an entirely different form of analysis to such mergers.³⁸ The same should be the case with high tech mergers. Therefore, we analyse separately the case of mergers where competition, although dynamically competitive, is **in** the markets as opposed to **for** the market.
- 7.6 Shapiro (2001) states that merger enforcement in 'high-tech industries follows the same principles that apply for mergers in other industries.... [M]erger enforcement in high-tech industries does tend to emphasize certain aspects of the analysis that may be less important in less dynamic industries.' (p16) First, concerns about innovation and the effects of innovation upon competition are more important relative to prices and output. Second, high-tech industries accentuate a number of the problems associated with predicting the future course of the market with and without a merger. For example, do existing market shares represent in any meaningful way the future competitive strength of firms? As Shapiro (2001, p17) points out, a frequent pattern that arises in merger cases in the new economy is where a company with an established older technology and larger market share seeks to combine with a firm with a new technology. The key question is whether the large market share of the older technology should be extrapolated into the future. A merger review in high tech markets often requires predicting the importance of future technologies and products that either are new to the market or will be introduced in the future. This makes hard and fast rules based upon market share of little practical use in merger analysis in these situations. Further, unthinking application of such rules in these situations can result in bad decisions. That is not to say, however, that merger analysis can not be entirely standard where highly innovative industries are concerned. An example of standard analysis being applied to an industry with high margins, network effects and a high degree of innovation is the Time Warner/Turner case study, discussed in Part II of this report.

³⁸ See, for instance, 'General Electric Co. plc and VSEL plc', Monopolies and Mergers Commission CM. 2852 (1995).

7.7 Third, and closely related, there may be considerable uncertainty about the technology and property rights that are essential to competition in the future. This is the same as in the case of the analysis of the competitive effects of cooperative behaviour.³⁹ However, as in those cases, one prominent remedy to counter anti-competitive concentrations of technology is to license the rights to that technology to other firms.⁴⁰ These three special characteristics of innovative high-tech industries have to be accounted for in the competitive analysis of mergers in such industries, particularly in analysing the two major categories of competitive concern in horizontal mergers – namely, unilateral effects and coordinated effects (or joint dominance in the EU).

Mergers: competition in the market

7.8 When competition is in the market, many of the standard procedures and indicators are useful when analysing the competitive effect of a merger. At least initially it is appropriate to define a market, calculate the market shares, look for barriers to entry or expansion if market shares are high, and think about how market power might be exercised to the detriment of consumers and others. However, at this point it is critical that the analysis raises the question of whether the market as it exists today will resemble at all closely the market in the future or whether there are changes coming in technology, market participants, or other developments that will radically change the market in the future. The answers to these questions may radically change the analysis of the merger in a number of ways.

7.9 First, if there are forces in the market that will seriously erode what appears to be a dominant position for the merged firms in the future, a merger that would seem to be anti-competitive based upon a static snapshot of today's market, may have no impact on competition in the future. For example, a few years ago competition authorities might have been concerned about a proposed merger among PC producers that would significantly increase concentration in that industry. We now know that with the ascendance of the Microsoft Windows operating system and the Intel chip as standard features, PCs have essentially become a commodity. Margins are low, and basically all that is required to enter the market is the ability to assemble standardized parts. The hypothetical merger would have had no effect upon the competitiveness of the industry but may have produced some corporate efficiencies that could have been passed on to consumers through this competitive process.

³⁹ See the chapter entitled 'Collective behaviour'.

⁴⁰ See the section entitled 'Licensing and access to intellectual property.' (paragraphs 5.81 to 5.96)

- 7.10 Second, one of the major concerns in mergers is the potential for a unilateral effect in that the merged firm will find it in its independent self interest to raise prices. The incentive to unilaterally increase the price of good A (if the firm merges with a firm providing a good B that competed with A) is a function of margins earned on the products involved and the diversion ratio between the products. The diversion ratio is the percentage of sales of good A that will switch to good B when the price of A is increased by a specified amount. The incentive to unilaterally increase the price of A is at a maximum when margins are high and when the diversion ratio is high.
- 7.11 In dynamically competitive markets this is a very difficult calculation to make using logit models or any other form of model because today's products will not in general be the same as those in the near future. It is almost certain that many of the critical relationships among those products relative to their being a unilateral effect will have changed. Therefore, attempts to estimate unilateral effects based upon current products are doomed to significant inaccuracy. Also, in dynamically competitive markets even the mix of products produced by the firms in a proposed merger is likely to change in a short period of time in the absence of the merger. Clearly, unilateral effects in such situations cannot be analysed in the same way, for example, as in the proposed merger of Staples and Office Depot.
- 7.12 However, some general principles do apply and the effects of product margins and the extent of product differentiation on incentives for unilateral price increases need to be kept in mind when assessing high tech mergers. If a merger involves two software packages that are close substitutes, then because product margins are very high unilateral price increases may be large. However, when products are highly differentiated the effect will be severely reduced, as the diversion ratio will be reduced. The principles that need to be kept in mind are as follows. Product differentiation **decreases** the interaction between products. Differentiated products that are within the market, but outside the merger, will therefore have less restraining effect on price increases. However, when the products within the merger are themselves differentiated, unilateral incentives to increase price will also be weak. High margins on the other hand, **increase** the importance of relatively low levels of product interaction.⁴¹ This means that products outside the merger will have more restraint on the ability of the merged firm to increase price than would be the case if margins were low. Likewise, if the products being merged have only a small amount of overlap in the market, if product margins are high this may still provide a competitive constraint on price increases that will be removed if the merger proceeds. The Adobe/Aldus merger case study in Part II details the concerns of a competition authority when margins and diversion ratios both appear to be high.

⁴¹ This analysis assumes there is no price discrimination between customers.

- 7.13 Now consider another major concern of merger analysis: coordinated effects or joint dominance. The cost conditions present in many high tech markets (high fixed costs but low marginal costs) mean that it is likely that most high tech markets will be characterised by relatively few players (and where competition is for the market, often just one dominant firm). But the mere fact that there are few players in a market should not lead to the conclusion that there are therefore likely to be joint dominance problems. The same cost conditions that mean there will be relatively few players also mean that the players in the market will have both the means and incentive to compete strongly. Low marginal costs mean that barriers to expansion are low (the means to compete strongly), and as margins are high, extra sales are particularly valuable relative to a market with high marginal costs and low margins. This creates a strong incentive to expand market share – a process that is likely to lower profits for all relative to collusion.
- 7.14 Another feature of high tech markets that makes collusion difficult is the likelihood of differentiated products that compete on features. This makes it difficult or impossible to identify a clear market price on which to agree. Dynamic competition based upon continual innovation makes tacit collusion or joint dominance virtually impossible to establish and maintain. One cannot easily observe R&D and it is even less easy to predict the future innovation it will produce. Therefore, the coordination of innovation and new products it fosters is virtually impossible among firms without explicit communication and planning. Accordingly, joint dominance should rarely be a concern even in concentrated markets where product differentiation and dynamic competition based upon continual innovation are present.
- 7.15 Finally, the effect of the proposed merger on the incentive of the merged firm to conduct R&D and innovate in the future should be carefully considered. If the merging firms are the *only* firms with the potential to innovate in their relevant market, the merger may have significant negative effects on investment in innovation. However, if the merger will result in only a few firms having the potential to innovate, it is difficult to predict what the firms' incentives might be. To the extent that competition through innovation remains in the market, a merger that strengthens the merged firm capacity to innovate will be likely to increase innovation and competition from innovation in that market.

Mergers: competition for the market

- 7.16 When competition can be described in broad terms as for the market, it can be particularly intense in the initial period. As noted previously, the fact that some markets are prone to tipping does not necessarily imply consumers enjoy less competition. It just means that the benefits arrive at different times. However, this assumes firms are not able to escape the initial competitive period by entering into deals. If competition in the initial phase is likely to be very intense

and high risk, two players may well decide they can both improve their positions by merging early. Competition authorities should be wary of accepting arguments that only one firm will survive, and so there is little damage to competition in the long run from a proposed merger, when it is clear that this will save the firms the pain of the initial battle for the market that should deliver significant benefits to consumers.

- 7.17 On a similar theme, in such markets firms may prefer to enter by acquisition rather than by developing products, a particularly expensive and risky undertaking in markets prone to tipping. Acquisitions should therefore also be screened for purchases where the prime purpose of a strong potential entrant is avoiding direct competition with an incumbent.
- 7.18 When the intense period of competition has occurred and a winner has emerged, there may be times when it is in the public interest to allow the vanquished firm to exit early by selling its installed base to the victor. If there is a reasonably sized base of consumers on what is now the losing technology, the incumbent may then have incentives to assist those customers by either maintaining the losing platform, achieving technical compatibility across platforms or helping customers migrate to the winning technology.
- 7.19 More generally, when innovation either in current product features and functionality or in completely new products is the predominant form of competition, the competition analysis should be more heavily focused on the potential impacts on this dimension of competition, and less on short term price effects.
- 7.20 A second special issue that arises in high tech markets is closely related to the first. High tech markets are often characterised by 'winner-take-all' competition, with the winner typically earning high (though often short term) profits as a result of winning. In markets where the nature of competition is that there will ultimately only be one player, or at least where there will be one very large player and a small number of niche players, it clearly does not make sense to be concerned about concentration *per se*. Instead, the authorities should be concerned about whether the merger changes the nature of the competition so that the winner is not determined on the merits of the respective alternative products or standards. Thus a merger that makes it significantly less likely that the 'best' product or standard will win should be viewed with some concern.
- 7.21 Similarly, when a large player is dominating, or is likely to dominate, small players may have little impact on current competition. However, small players may be much more significant in terms of future competition than current market shares would suggest. Authorities should therefore be wary of mergers

that remove players who appear to be of little significance in the market, but have the capability to create future competition. This again requires more focus on the capabilities of firms, and less on current positioning.

- 7.22 Market definition in a high tech merger where competition is for the market may again provide some particular difficulties for competition analysis. Market definition in these cases is likely to be a supply-side analysis since what matters is the potential of various suppliers to provide the relevant innovation. Whilst this part of the market definition may not be too problematic (although equally it may well be difficult, as many supply-side market definition analyses are), calculating meaningful market shares is nevertheless likely to be very difficult as there is no established product whose share can be calculated. This means that the authorities should focus on the number of players in the market post-merger with the capabilities needed to compete, and on whether the merging parties will have such a competitive advantage post-merger that they will either be likely to win regardless of the merits of their product, or that they will be able to slow the pace of innovation without significantly reducing the likelihood that they will win. If we consider this in the light of the patent race literature, one issue is whether the merged parties are so far ahead of their rivals as a result of the merger⁴² that their rivals exit the race, thus allowing the merged entity to innovate more slowly.
- 7.23 Even more fundamentally, where competition takes place for the market, joint dominance concerns are likely to be misplaced. Collusion depends on all players achieving a position where their best option is to cooperate rather than cheat. In markets where one or two players have the potential to be big winners, while the rest are likely to be major losers, there is a strong incentive to cheat (a large prize to the winner), and a large cost to cooperating if it turns out that other firms cheat (you get to be a big loser). In the extreme case of a 'winner-take-all' race, there can be no possibility of coordination between competitors. When the equilibrium outcome is for only one to survive, the only viable strategy is competing to win. Thus where competition is for the market, mergers that reduce the number of players cannot lead to joint dominance concerns.

Vertical mergers

- 7.24 The prime potential concern in high technology vertical mergers revolves around two-level entry theory.⁴³ That is, the potential for vertical integration to exclude competitors or reduce competition by requiring actual or potential

⁴² This situation might arise if, for instance, the innovation required three separate innovations and if the merging firms had already completed two of these innovations (one each) and no other player was close to having completed two.

⁴³ See the section entitled 'Tying and bundling,' where this issue is discussed further. (paragraphs 5.36 to 5.68)

competitors to compete at multiple levels in the business, or in multiple products. An example of this type of concern was the acquisition by Silicon Graphics (SGI), a maker of high-end graphics workstations, of Alias and Wavefront, two software houses specialising in entertainment graphics software. This raised concerns about the potential impact on competition that might result from the manufacturer of specialised computer hardware (and associated operating systems) integrating with formerly independent applications development functions.⁴⁴ For two level entry to cause competition problems, it must be significantly more difficult to enter at two levels than one. Furthermore, a single level entrant must be significantly disadvantaged by not having its component work with the complementary component produced by the merging firms.

- 7.25 It should be recognised that the issues raised by vertical mergers of this type are in fact issues already discussed in detail in the context of bundling⁴⁵ and tying, exclusive dealing, predation, and so on. The competitive concerns arise from the possibility that a vertically integrated firm may have an increased incentive and ability to interfere with competition, and may be able to engage in practices following integration that it would not otherwise have been able to. The prime objective in investigating a vertical merger therefore is to accurately identify the potential competition problems, the mechanisms that would be employed, and then analyse them within the correct framework. For example, if the concern was that Silicon Graphics would unilaterally impose technical incompatibility between its workstations and other suppliers software, then the underlying issue is the potential to tie the products by this method. This problem should then be analysed as a (potential) tying problem.
- 7.26 Another special issue in vertical mergers arises out of the fact that complements tend to be a more important competitive factor in high tech markets than in standard markets. If complementary products or standards are a very important source of competitive advantage, vertical mergers between complements are likely to have a greater effect on the competitive process than in most industries. This does not of course mean that vertical mergers should therefore not be permitted in high tech markets. It merely means that vertical mergers should probably be looked at more closely than is usually the case. For instance, a vertical merger between a firm (Firm A) fighting to be the winner in a 'winner-take-all' race and a firm (Firm B) that provides a necessary complement required by whoever wins the race might well raise some competition concerns. If the merged firm did not allow other firms access to the necessary complement provided by Firm B post-merger, then this might have the effect of determining

⁴⁴ This is discussed in the Silicon Graphics case study in Part II of this report.

⁴⁵ An example of a merger in which bundling was an issue was the Time Warner/Turner merger, discussed in Part II of this report.

who wins the 'winner-take-all' race that Firm A was engaged in pre-merger. Of course, as with all vertical issues, if there is no horizontal market power, then there will not be a competition concern.

Other considerations

SYNERGIES

- 7.27 The high fixed cost nature of production in high technology industries will often suggest that significant efficiencies can be gained from removing duplication, and in ensuring efficient production scales can be achieved. There may also be significant synergies achieved from sharing knowledge and combining skills – though in some cases this may be difficult to assess. However, these potential benefits have to be balanced against the loss of variety and competition that might result from the merger. Furthermore, as in any merger investigation, claimed benefits should only be taken into account if they cannot be achieved in a less anti-competitive manner. In particular, claims that a merger is needed to gain access to intellectual property should be carefully examined to ensure equivalent results could not be achieved through licensing.

INTELLECTUAL PROPERTY

- 7.28 In many high tech mergers the issues will revolve around intellectual property. Analysing mergers involving the owners and developers of intellectual property is broadly analogous to assessing a cross-licensing or patent pooling proposal.⁴⁶ Consideration should be given to whether the property rights involved are complements or substitutes, whether technology capable of competing exists outside the merged parties, and whether there will be incentives to innovate in the future.
- 7.29 A significant difference between mergers where dominance from aggregation of intellectual property rights is likely and more traditional mergers results from the fact that intellectual property is 'non-rivalrous in consumption.' In other words, multiple parties can use it simultaneously. This means there will be cases where licensing can enable a merger to proceed that might otherwise be blocked, or significantly modified by a divestment remedy, by creating viable rivals who have licences to the critical intellectual property involved. Licensing remedies are relatively common in the US, and have the potential, if well constructed, of allowing firms to achieve the synergies of a merger unimpeded, while still maintaining the potential for competition.

⁴⁶ See the section entitled 'Cross-licensing and patent pools.' (paragraphs 6.32 to 6.45)

UNCERTAINTY AND SPEED OF CHANGE.

- 7.30 One of the characteristics of markets in which there is a large amount of product innovation is that there is also usually a large amount of uncertainty as to how the market will develop in the future, both in terms of products and firms. This creates a serious difficulty for merger policy. One possible reaction to the observation that the future is very uncertain is to run a more permissive merger policy on the basis that it is harder to be sure that a merger will lead to consumer detriment. This would be a perfectly reasonable approach to take if it were possible to undo any consumer detriment at a later date. However, this may be particularly difficult in a high tech environment since, as noted earlier in this report, high tech markets can be characterised by tipping and by 'winner-take-all' competition. A merger policy that responded to uncertainty by trying to delay decisions (ie, allow the merger in the expectation of being able to remedy any consumer detriment at a later date) might run the risk of delaying the decision until after the point at which intervention could usefully take place.
- 7.31 This is a difficult problem. On the one hand the authorities do not want to block mergers unnecessarily, particularly if there are efficiencies associated with the merger that are likely to benefit consumers. On the other hand the authorities do not want to allow mergers that lead to markets tipping in a manner that causes consumer detriment. There is no easy solution to this problem. However, one potentially useful approach may be to deal with uncertainty by allowing mergers to proceed, but with undertakings that create options that come into force should the merged firm become dominant.⁴⁷ For example, it may be possible to gain undertakings from the merged firm guaranteeing that it will maintain open standards and interfaces in the event that the market tips post-merger, with this requirement being triggered by the firm exceeding an agreed market share.

CONCERNS OVER FUTURE EXCLUSIONARY CONDUCT

- 7.32 Finally, because merger analysis is forward looking, any standard such as a substantial lessening of competition requires some projection of future conduct, such as a unilateral price increase or tacit collusion. But either explicitly or implicitly, competition authorities also worry about future exclusionary conduct by a dominant firm as well. They must consider whether a merger is going to create a giant firm, which because of its size and the number of related markets in which it operates, may engage in exclusionary conduct that will substantially

⁴⁷ There are other times when regulators can rely on future options that are available rather than resolve issues at the time. The British Interactive Broadcasting case study provides a useful example (see Part II).

lessen competition. In this case, the competition authority must decide whether it believes it can deal with anti-competitive behaviour effectively later using the available regulatory tools, (as an abuse of dominance) or do they feel they must prevent it from happening beforehand. Clearly, the European Commission has had this in mind when opposing mergers where it sees portfolio power. This generally involves giant firms with significant market shares in a number of closely related markets.

7.33 There are at least two possible approaches to this dilemma. One is not to try to predict possible exclusionary conduct and to rely on competition law to deal with any future abuse under those laws. This approach may lead to a costly, time consuming process; it may be impossible to undo the anti-competitive conduct of the dominant firm and there may be no satisfactory remedy. If the competition authorities felt that they could deal effectively with any anti-competitive conduct after it had occurred, there would be no need for merger policy. Clearly this is not the case in jurisdictions where excessive pricing is an abuse. We do in fact systematically try to predict unilateral pricing effects and deny mergers where price rises might be significant.

7.34 The second approach, and the one we believe is followed at least implicitly by the European Commission, FTC and DoJ, is to consider potential future anti-competitive conduct from all sources including exclusionary conduct, and then to weigh these against the efficiency and other possible benefits of the merger such as promoting European integration. The European Commission's discussion related to portfolio power is evidence of this. The Commission states in their Guinness/Grand Metropolitan decision that:

The holder of a portfolio...may enjoy a number of advantages... [H]is position in relation to his customers is stronger since he is able to provide a range of products and will account for a greater proportion of this business, he will have greater flexibility to structure his prices, promotions and discounts, he will have greater potential for tying, and will be able to realise economies of scale and scope in his sales and marketing activities. Finally, the implicit (or explicit) threat of a refusal to supply is more potent. (paragraph 40)

7.35 Note, here the Commission is concerned about potential tying and refusal to supply which are exclusionary conduct that could be handled as an abuse of dominance. Note also their concern that the merger will create exclusionary power as well as pricing power; in effect incorporating it into their definition of dominance.

7.36 However, one must be careful when using an approach that tries to anticipate all future misconduct. This can lead to making up anti-competitive horror stories about what future competitive nightmares might occur instead of a careful

analysis of what might reasonably happen and of whether it could be handled in the future if it occurred. For example, full line forcing, a concern expressed in connection with portfolio power, might reasonably be handled as an abuse of dominance at a later date. However, this tension between pre-emptive preventative action and later remedial action is not an easy one and it will not go away. Such concerns will always be in the minds of the competition authorities and the courts when making decisions regarding mergers. It is better that these concerns be made explicit so they can be subjected to analysis and criticism. This tension is particularly strong in the new economy where the benefits from cooperation or mergers can be great, but the danger of allowing anti-competitive situations to develop can also be great.

Conclusions

- 7.37 The most important question to ask when assessing a merger in a market characterised by a high degree of product innovation is: what is the nature of competition in this market? Does competition take place in the market or for the market? Where competition is for the market, the authorities must accept that the equilibrium is likely to have only one player and should therefore not be worried about concentration or dominance *per se*. Instead they should worry about whether a merger in such a market is likely to change the identity of the winner of the race in a way adverse to consumers and whether it is likely to slow down the timing of innovation, or significantly reduce incentives to innovate.
- 7.38 The nature of high tech markets is such that genuine joint dominance concerns should be relatively rare. Many markets will have only one significant player and so almost by definition cannot give rise to joint dominance concerns. Where competition is in the market, not for the market, the cost conditions of these markets may well give rise to relatively few players, but will also mitigate against tacit collusion due to low barriers to expansion and high margins.
- 7.39 Vertical mergers may be problematic if they lead to exclusion of rivals at one vertical level. In a market where a complementary product is very important and has only one supplier (eg, IP), exclusion may be a real concern.
- 7.40 Finally the merger standard of a substantial lessening of competition provides a more useful focus than that of dominance because often markets will have a dominant firm in any case. For many mergers in the new economy the relevant question is whether a merger will strengthen or weaken competition in the process of determining the dominant firm.

ANNEXES

A IS INFORMATION TECHNOLOGY DIFFERENT?

- A.1 There has been a great deal of high profile coverage of competition law enforcement action in the area of information technology. This raises an interesting question – is the information technology industry particularly susceptible to competition problems associated with dynamic markets, or is it just the most visible?
- A.2 Agricultural biotechnology (agbio) is another area where dynamic competition is very important. Like Pharmaceuticals, it is a knowledge intensive business, where the key success factors are successful research and possession of intellectual property rights to protect commercially valuable discoveries. However agriculture, unlike medicine, is seen as a low-margin commodity business. As a result, The Economist (2 November 2000) reported that some British fund managers simply do not want to hear the words ‘agricultural biotechnology.’
- A.3 With significant R&D expenditure required, limited investor interest and the need to accumulate portfolios of IPRs, agbio would seem to be an area with the potential for competition amongst few rather than many firms, and therefore potentially an area where competition problems might be expected. Has this been this case?
- A.4 Barton (1997) reports that there has been a radical increase in the level of litigation involving agbio in the US. The cases are primarily of two types. The first is the (relatively common) type of patent litigation that involves allegations of violations of relatively narrow and well-defined patents. This type of enforcement is needed to make the incentive effects of patents work. However, the second type of case is more of a problem. These cases involve patents that cover entire markets, and appear to be an effort to drive out all competitors, or at least establish strong positions for entering licensing arrangements. A core problem in agbio is the ability to patent processes and inventions with a variety and scope that is so broad that it is becoming very difficult to create new plants without infringing existing IPRs.
- A.5 Firms will ultimately solve many of the resulting disputes by agreement, as has been the case in other industries. Cross-licensing issues, and issues associated with the ultimate cross-licence mergers can therefore be expected in agbio.

Indeed, the trend in the US has been for rapid consolidation in this industry. This will require close monitoring by competition authorities that will need to establish which arrangements and mergers are pro-competitive, and which should be blocked as anti-competitive.

- A.6 While this discussion has involved the US experience, most nations have similar patent laws, and agbio issues of this type can be expected to materialise in most jurisdictions. This experience shows that, while information technology markets have their distinguishing features and particular competition problems, competition issues associated with innovation are by no means limited to information technology markets.

B ARE INNOVATION MARKETS USEFUL?

- B.1 There has been a good deal of debate over whether it will ever be useful to define 'innovation markets' in cases where the competition issue of interest involves a market for research and development, rather than a market for goods and services. The Antitrust Guidelines for the Licensing of Intellectual Property issued by the US DOJ and FTC (6 April 1995) describe an innovation market as follows:

If a licensing arrangement may adversely affect competition to develop new or improved goods or processes, the Agencies will analyse such an impact either as a separate competitive effect in relevant goods or technology markets, or as a competitive effect in a separate innovation market. A licensing arrangement may have competitive effects on innovation that cannot be adequately addressed through the analysis of goods or technology markets. For example, the arrangement may affect the development of goods that do not yet exist. Alternatively, the arrangement may affect the development of new or improved goods or processes in geographic markets where there is no actual or likely potential competition in the relevant goods.

An innovation market consists of the research and development directed to particular new or improved goods or processes, and the close substitutes for that research and development. The close substitutes are research and development efforts, technologies, and goods that significantly constrain the exercise of market power with respect to the relevant research and development, for example by limiting the ability and incentive of a hypothetical monopolist to retard the pace of research and development. The Agencies will delineate an innovation market only when the capabilities to engage in the relevant research and development can be associated with specialised assets or characteristics of specific firms.

- B.2 There has been considerable debate over whether an 'innovation market' is a useful or even meaningful concept. Richard J. Gilbert and Steven C. Sunshine (1995) argue that delineating innovation markets can be a valuable instrument for evaluating the effects of merger-induced structural changes on the incentives for research and development and the resulting pace of industrial innovation. They argue that analysing the competitive effects of a merger on actual or potential competition in existing product markets may fail to capture the consequences of alterations in innovative effort. This may be through loss of product or production improvements, or through the loss of new product development. Likewise, the OECD Competition Policy and Intellectual Property roundtable held in October 1997 reported that:

Cases involving competition to produce the next generation product, where the contours of that product are not completely clear, are harder to analyse without the innovation market concept.

- B.3 Shapiro (2001), along with others, notes that the innovation market mode of analysis can quite easily be seen as involving traditional issues of potential competition.
- B.4 Against this, commentators such as Carlton, Hay, Hoerner and Rapp (1995) all question the use of innovation markets. Rapp (1995) argues that innovation is hard to measure, and that R&D is only a proxy for innovation. He also notes that neither economic theory nor any factual analysis of the connections between market structure, R&D, and innovation provides a persuasive basis for the innovation market approach.
- B.5 Increases in R&D concentration may or may not lead to less R&D, and may or may not affect future prices. The OECD roundtable summarises the criticisms as being that innovation markets are 'speculative', barriers to entry to innovation are low, and as a result, it is better to focus on product markets.
- B.6 Whether barriers to entry in innovation are low in a particular case is a factual matter, which must be dealt with in the context of the particular issue at hand. Furthermore, it is incorrect to assume that barriers to innovation will always be low. While it may be that an individual with little capital or equipment can create a new software product, there are not too many examples of new generations of military aircraft being fabricated by lone inventors in garages in Silicon Valley.
- B.7 Because there is no clear theoretical or empirical link between current R&D effort and future innovations and eventual consumer benefit, it can be argued that it is purely speculative to relate any change in an R&D market to potential changes in future competition. As a result, some writers argue that competition authorities should not define innovation markets. These commentators do not believe that competition authorities can reliably make useful predictions about the implications for future competition of changes in current R&D, and therefore conclude that those authorities should avoid taking the first step of defining a relevant market.
- B.8 There are fundamental difficulties raised by the fact that R&D is not an output, but an input. Reducing the level of R&D undertaken is not equivalent to a monopolist constraining quantities in an output market. In standard microeconomic analysis, constraining output causes prices to rise above costs, and detriment to occur both from the inefficiency (dead weight losses) that results, and from the resulting wealth transfer from consumers to producers. There is no theoretical equivalent effect resulting from reducing R&D. A reduction in R&D expenditure

as a result of mergers, or R&D joint ventures, may simply eliminate duplication, enhancing efficiency. It may even lead to more innovation with less total cost due to knowledge sharing. Or alternately, it may lead to less innovation. Economic theory does not predict which of these is likely to result, simply from the observation of a reduced level of input.

- B.9 Collusion in R&D is unlikely. Reasons for this include the difficulty of observing the level and nature of R&D activity, making monitoring of any collusive agreement difficult, and increasing the incentive to cheat on any tacit agreement. Cheating on an R&D agreement can yield first mover advantages, a pre-emptive patent or at a minimum lead time advantages, any of which may lead to a significant competitive advantage. It is also possible to conduct R&D without taking new products to market until a significant advantage is created, further encouraging continuation of development work.
- B.10 Because R&D markets are input markets, with no clear connection between inputs (R&D effort) and outputs (innovations), and collusion is unlikely in innovation, critics are understandably uneasy about defining an innovation market in a manner analogous to a conventional (output) market defined around products or services. The greatest danger in utilising such an apparently familiar approach is that the investigating team will then proceed to conduct an equally conventional competition analysis of the market. There is little doubt that this would be a mistake. It cannot be assumed that high market shares in R&D spending imply any form of dominance. Equally, it cannot be assumed that a highly concentrated innovation market might be expected to have the sorts of effects, such as the possibility of tacit collusion, that might be expected in a goods market.
- B.11 Overall, there is a good deal of criticism of the use of innovation markets by US enforcement agencies. However, it is notable that the criticism focuses on whether it is likely that **in general** useful conclusions can be drawn by analysis of R&D effort today on product market competition in the future. This raises two issues. The first is that innovation markets certainly exist. There is little doubt that various individuals and firms exist to create ideas and inventions related to various industries, and that the resulting ideas and innovations are traded. There will be times when such activity will not be clearly related to existing product or technology markets. If such markets exist, then competition authorities are likely to have to analyse them from time to time, regardless of whether that analysis is easy or difficult to undertake. The second issue is that, while it may be quite reasonable to conclude that in general it is not possible to link R&D effort today to future product competition, this is not to say that it will *never* be the case that a sensible judgement call can be made. It may be evident from the facts in a particular case that a reduction in innovation was the intended result of a particular anti-competitive act.

Conclusions

- B.12 On balance then, the question is whether innovation markets have a useful place in competition analysis. The debate on the usefulness of the innovation market concept suggests a number of guiding principles should be employed. The first is that it is likely to be better to analyse competition and potential competition in the context of product markets, whenever this is possible. This avoids both entering into excessively vague speculation, and the possibility that focussing on the alleged effects in the 'innovation' market will draw attention away from the degree to which the downstream products are subject to competition.
- B.13 Secondly, if product markets cannot be defined because it is not clear what products might be developed, but there is clearly a reduction in the level of rivalry that will take place in a market that involves R&D, then it may be necessary and desirable to analyse the relevant innovation market. However, if this option is taken, it is critical to understand that the tools applied in output markets cannot be blindly applied to analysing an input market. In particular, while analysis of barriers to entry may be similar to an output market, it is unlikely that measures of market share or concentration changes will convey any useful information in themselves. A detailed fact-based analysis of each case will be required. It is almost certain that this will culminate in a judgement-based decision, balancing the potential costs and benefits of the issue being considered.

Innovation markets – the Ciba-Sandoz merger

- B.14 In 1996 the US FTC investigated the merger between Ciba-Geigy Limited (Ciba) and Sandoz Limited (Sandoz) which created a new firm named Novartis. The merger raised a number of competitive concerns. The concern of interest here was in the area of gene therapy research.
- B.15 Gene therapy involves treating diseases or medical conditions by modifying genes and then inserting the modified genes into a patient's cells. The FTC's analysis of the likely competitive effects from this merger applied the concepts of technology and innovation markets.
- B.16 Ciba and Sandoz controlled crucial inputs for developing gene therapy products, and the FTC believed that the merger would create an unmatched portfolio of intellectual property assets needed for commercialising gene therapy products. The complaint alleged that, while a substantial number of other companies were able to conduct preliminary gene therapy research, without licences to crucial intellectual property held by Ciba and Sandoz these other researchers would not be likely to continue development. Furthermore, the merger would create a disincentive to license intellectual property rights to, or collaborate with, other researchers when compared with the pre-merger incentives of the

independent competitors, Ciba and Sandoz. To remedy the alleged competitive harms, a consent order was put in place providing for a set of patent licences to allow other companies to restore the competition otherwise lost due to the merger.

- B.17 This case provides an illustration of a situation where one of the identifiable potential competitive effects of a merger was a reduction in the level of independent research taking place in a market for gene therapy research. Given this, defining a market for those specialised research services is likely to be a useful exercise.

Source: United States (FTC) contribution to OECD Competition Policy Roundtable, Competition Policy and Intellectual Property Rights, Roundtable in 1997, published 1998.

C COMPETITION POLICY ENFORCEMENT IN THE NEW ECONOMY

- C.1 This is one of the major questions that the OFT wanted addressed by this report. In the previous annexe we made the case that, even in the world of Schumpeterian competition that appears to be a feature of the new economy, competition policy directed toward keeping the competitive process open and relatively free of behaviour designed primarily to obstruct or limit the ability of other firms to compete effectively had an important potential role to play. Similarly, it was argued that that there was potentially an important role for competition policy in preventing a monopoly or dominant firm from using the power derived from its dominance to prolong its dominant position or to expand its dominance into related markets by anti-competitive acts. We used the words potentially beneficial because we left open the unanswered questions as to how best to do this, whether the current laws and the competition authorities are up to the job, and whether the benefits of enforcement on balance exceed the costs.
- C.2 In this annexe we address these additional issues by looking at positions of a variety of experts with somewhat differing points of view. On balance, all of the answers to these questions are informed judgments. What we have found is near unanimity that it is important to continue to enforce competition laws in new economy industries, general confidence that the competition laws are sufficiently robust to be adapted to deal with the competitive issues that arise in the context of the new economy, and varying degrees of optimism about the ability of the enforcement agencies and the courts to meet the challenges of cases generated by the new economy. There is also general agreement that the benefits of continued enforcement outweigh the costs. The general consensus is that we should proceed, but with caution, that we should be flexible in applying the standard competition analysis paradigm, and that we should carry out enforcement with an understanding of the special characteristics of the new economy identified in the previous annexe. This summarises the conclusions that the statements in the rest of the annexe support. The reader who does not accept that there is such a concern, or who is not interested in the views of a range of experts on the need for enforcement in dynamically competitive industries, should skip to the next section.
- C.3 The concern is sometimes raised that in the dynamic competitive environment of the new economy, antitrust enforcement will simply throw a spanner into the works of the engine of efficiency, innovation and growth. Behind this stated concern are generally one or more assumed or implicit premises.

- That in such a dynamic and competitive environment no firm can maintain a monopoly or dominant position except by continually outperforming its competition by being more innovative and producing generation after generation of superior products. Implicit in this line of argument is the assumption or assertion that anti-competitive acts by the dominant firm cannot play a significant role in perpetuating the dominant firm's position because of the very nature of the competitive process.
- A second line of argument concerns the alleged slowness and ineptitude of the competition authorities, and the potential faults of the current competition paradigm of defining markets and assessing market power that make it ill suited to evaluating the competitive situation in the new economy. These alleged failings are interpreted as implying that intervention by competitive authorities in such markets will do more harm than good, even if anti-competitive behaviour takes place and produces significant anti-competitive effects. We believe that this is the wrong conclusion to draw.

C.4 This basic criticism is characterised and answered by William J. Baer and David A. Balto (1999)⁴⁸:

The most obvious criticism of antitrust enforcement as applied to high-tech industries starts with the notion that these are fast moving industries in which today's technology is quickly outmoded, opening the way for new competitors to overturn the dominance of incumbents. If those generalisations were uniformly true of high-tech markets, then surely antitrust enforcement would be less important. Except for price fixing and other '*per se*' violations, antitrust ought to leave such markets alone, for any effort to create or exercise market power would quickly be corrected by market forces.

Of course experience shows that this caricature of high-tech markets is true in some cases and false in others. For example, even in an innovation driven market, dominance in one generation may enable a firm to gain exclusive control over critical inputs, such as software applications, allowing monopoly power to be carried over from generation to generation regardless of the relative superiority or inferiority of the incumbent's later generation of products.

While it is true that rapidly evolving technology may, in many circumstances erode entrenched interests, there may also be many countervailing tendencies that strengthen monopoly power (p75).

⁴⁸ At the time of this article the authors respectively held the positions of Director, Bureau of Competition, FTC and Assistant Director, Office of Policy and Evaluation, Bureau of Competition,

- C.5 Among such factors that tend to strengthen monopoly power, they include networking effects, 'winner-take-all' markets, patents or other intellectual property, large economies of scale and high sunk costs, all characteristics associated with new economy industries. The evidence seems overwhelming that anti-competitive situations can and do arise and persist in high-tech, dynamically competitive industries. In addition to the direct evidence of this, there is a growing academic literature that rigorously sets forth how this can take place. Further, many of the issues that have arisen in the context of industries in the new economy have arisen previously and have been addressed by the agencies and the courts in previous contexts.
- C.6 There are two recent papers by two distinguished antitrust lawyers and scholars, Donald I. Baker⁴⁹ and Judge Richard Posner, that address the issue of antitrust enforcement in the new economy. Both take the position that in the new economy competition or antitrust issues will arise. Both express some confidence that existing precedents and modes of analysis will suffice to deal with most if not all of them. It is also interesting to note that both men, who have seen antitrust enforcement in action in the United States as participants, Baker as Assistant US Attorney General for Antitrust and Posner as a federal judge, express some concern about the institutional limitations on effective competition policy development and enforcement. Nevertheless, they both support continued competition policy enforcement in new economy industries while expressing the need for caution.
- C.7 Judge Posner (2000) states in a recent paper entitled 'Antitrust In The New Economy':

Concern has been expressed recently that US antitrust law may not be well suited to regulating the 'new economy.' Doctrines developed to deal with competition and monopoly in smoke stack industries are not well adapted, it is argued, to dealing with the dynamic economy of the twenty-first century. What I shall argue is that there is indeed a problem with the application of antitrust law to the new economy, but that is not a doctrinal problem; antitrust doctrine is supple enough, and its commitment to economic rationality strong enough, to take in its stride the competitive issues presented by the new economy. The real problem lies on the institutional side: the enforcement agencies and the courts do not have adequate technical resources, and do not move fast enough, to cope effectively with a very complex business sector that changes very rapidly. This problem will be extremely difficult to solve; indeed, I cannot even glimpse the solution. (Posner, 2000 p2)

⁴⁹ Donald I. Baker is a member of the Advisory Panel to this project.

C.8 He then goes on to state that:

The focus of concern with the application of antitrust law to the new economy is on the methods by which a firm that has a monopoly share of some market in the new-economy industry might seek to ward off new entrants. The lawyers and economists who express this concern are fearful lest a 'Chicago school' approach to antitrust deny the possibility that a single firm, without collaborating with competitors or potential competitors (thus inviting application of the rules against price-fixing and large horizontal mergers) can, at least under new-economy conditions though probably more generally as well, prevent efficient challenges to its monopoly. If the Chicago-school approach so understood is law, these critics want it modified to do service in new-economy antitrust cases. This is a misunderstanding of the Chicago school, at least if I can be considered a member of the school in good standing. The approach is sceptical – but no stronger word would be correct – about the danger to competition that is posed by unilateral firm action, unilateral in the special sense that it does not require cooperation with competitors (it usually requires cooperation with customers or suppliers). (Posner, 2000, p5)

C.9 The point here is that even Judge Posner, who identifies himself as a member of the Chicago school, recognises that basic competition issues arise in the context of the new economy, its dynamism notwithstanding. At the same time he despairs that the complexity and speed of this new economy poses practical institutional problems for the employment of competition policy for which he cannot 'even glimpse the solution.' What is particularly of interest, however, is that Judge Posner with all these reservations would continue antitrust enforcement in the new economy – but with caution:

Unfortunately, the measures that I have suggested, even in the unlikely event that they are adopted, would probably not do a great deal to correct what seems to me a serious mismatch between the conditions of the new economy and the institutional structure of antitrust enforcement. That brings me to the final question I address, which is society's proper response to a situation of at least temporarily ineradicable uncertainty concerning the effect of governmental intervention in the economy. We really don't know what the effects of applying antitrust principles to the new economy will be, except when they are applied just to stop horizontal price-fixing or mergers of major competitors in highly concentrated markets. I think a policy of zero enforcement against alleged exclusionary practices in the new economy would be a mistake, because there is a pretty solid theoretical basis for concern both that some new-economy firms would find it in their rational self-interest to employ such practices and that natural market forces would not undo those practices in time to avoid

significant social costs. A policy of zero enforcement would also deprive us of important information about competition and monopoly in this vital sector of the national economy. Clearly, though, the byword of a prudent enforcement agency and a sensible court will be: caution. (Posner, 2000, p11)

- C.10 Baker (2000) expresses some similar views, in a recent paper prepared for a presentation at a conference on E-Commerce. He states that:

It is my strong sense that antitrust policy is sensible enough and flexible enough to meet the needs of our new electronic age. I am less certain that our antitrust process can be made to work fast enough to be relevant in various e-market circumstances.

In this paper, I shall try to touch on what I see as the key competition-related issues in our revolutionary world of electronic transactions and platforms. Most of the issues are generally familiar to those in the antitrust field, but their application in the world of e-competition is not. This is of course simply the latest (and probably swiftest) stage in a process that is as old as the common law – of adapting legal rules, rights and duties in new and changing circumstances. (Baker, 2000, p2)

- C.11 Notice that, like Posner, Baker expresses confidence that the basic framework of antitrust laws and the fundamental mode of analysis can be adapted to new factual situations arising in the world of e-commerce, and he similarly raises concerns about the speed of the enforcement process. He also sees the critical analytical issues as market definition and the analysis of market power:

I raise this market definition issue because it is so easy to get it wrong in novel circumstances. Inept market analysis may be the real threat of antitrust becoming 'a serpent in the garden of efficiency'. (Baker, 2000, p3)

- C.12 The conclusion reached by both Posner and Baker is that traditional antitrust concepts, rules and methods of analysis do apply to competition policy issues in the new economy although they need to be adapted to new situations with intelligence and applied with some caution. Further, they would argue that whatever the institutional shortcomings might be, they do not justify abandoning antitrust enforcement in the innovative industries of the new economy. The obvious implication of this sort of thinking is that the agencies need to ensure that their thinking on these issues is up to date.

- C.13 Professor Franklin M. Fisher⁵⁰ (2000a, pp559-564), another veteran of the antitrust enforcement wars and a consistent contributor to the economic literature on competition policy, fully concurs:

There is one more issue about antitrust in innovative industries that merits discussion. It is sometimes claimed (often in connection with Microsoft's ongoing public relations campaign), that antitrust standards should not be applied to innovative industries because those industries change more quickly than the judicial system can act, making any monopoly power transient and any relief irrelevant... It is true that antitrust in innovative, quickly changing industries must be carefully applied. In such industries, it would be wrong to look only at static situations – at the snapshot rather than the movie of what is going on. Hence, antitrust authorities, in deciding whether to prosecute, should consider the question of whether the situation will be self-correcting. Further, the changing nature of the industry must be taken into consideration in deciding whether acts alleged to be anti-competitive could reasonably have been directed at the suppression of competition, which is going to be effective anyway...

But it is a long way from this to a conclusion that antitrust has no place in innovative industries. Traditional antitrust analysis is and should be applicable to innovative industries. The difficulties of doing so should prompt no change in the rules, properly understood. To do otherwise is to provide a licence to destroy competition under the excuse that the firm is innovative. Moreover, hard though it may be in some cases to decide whether what is going on is, on balance, anti-competitive or simply desirable innovation, there is no escape from doing so.

- C.14 It is revealing to juxtapose the position stated by Professor Fisher with that of Professor Schmalensee, an equally distinguished economist with antitrust credentials to match, who represented Microsoft and thus opposed Professor Fisher in that case. Despite the fact that the two have diametrically opposing views on most of the issues in the Microsoft case, their stated views on the role of competition policy in the new economy are not inconsistent. Both would continue enforcement and recognise the need to account for the dynamic aspects of competition in the new economy. Evans and Schmalensee (2001) state:

We do not contend that dynamically competitive industries should be immune to careful antitrust scrutiny, nor that the basic principles of antitrust should be modified in these sectors. Fixing prices or preventing competitors from distributing their products will generally harm

⁵⁰ Professor Franklin M. Fisher is a member of the Advisory Panel to this project.

consumers even if dynamic competition is vigorous. Nonetheless, the application of antitrust principles should take account of the important ways new-economy industries differ from traditional ones. In recent decades, careful use of economic analysis has generally aligned antitrust more closely with the interests of consumers. To continue this trend, antitrust policy must reflect the features of dynamically competitive industries (many new-economy industries) that differentiate them from statically competitive industries (most old-economy industries). (p3)

- C.15 Professor Carl Shapiro (2000) expresses positions on these critical issues that are consistent with those of Posner (2001), Baker (2001), Fisher (2000), and Evans and Schmalensee (2001). It should be noted that he is particularly well placed to offer commentary on these issues as, in addition to being one of the most prolific contributors to the burgeoning literature on the structure and behaviour of the information technology industries of the new economy and the implications for competition policy, he has also recently served as Deputy Assistant US Attorney General for Antitrust, directing economic analysis of antitrust issues at the US Department of Justice. In general, Shapiro (2000) believes there are important competitive issues to be addressed and he is generally optimistic that competition agencies and the courts supported by good economic analysis are up to the task:

Some commentators have suggested that enforcement officials should leave the high-tech sector alone, since it is fluid, experiencing rapid technological change, and by-and large displaying vigorous competition. Yet few can deny that pockets of monopoly power remain, usually associated with the control of some information bottleneck: local telephone companies, cable television operators, and Microsoft present themselves as examples, but many more companies enjoy powerful positions, often based on their control over interfaces or standards, if not genuine bottlenecks of network hubs. The leading goal of competition policy in the information economy should be to hasten the erosion of such monopoly power, and to prevent the use of monopoly power to destroy competition in adjacent markets.

- C.16 He goes on to say that:

In a world of networks, where interfaces, compatibility, standards, and bottlenecks take on great significance, competition authorities cannot afford to stand on the sidelines just because innovation is rapid. To the contrary, competition authorities have a duty to prevent today's dominant firms from stifling innovation that threatens their leadership. I am hopeful that competition authorities are up to the task. Looking at the US experience, merger policy is on a sound footing, and antitrust is not impeding companies from cooperating when necessary to combine their offerings and to establish

standards. Regarding unilateral conduct by dominant firms, the Justice Department's recent action against Microsoft will likely have a profound effect on how monopolisation cases are viewed in the information economy. (p19)

C.17 Shapiro expresses considerably more confidence than Judge Posner in the ability of the enforcement agencies and the courts to deal with antitrust enforcement while agreeing that the antitrust laws should apply to the new economy. To the extent that there is any validity to the argument that competition in the industries of the new economy is so dynamic that temporary pockets of market power cannot be sustained for long and therefore there is no need for antitrust enforcement, that argument will nonetheless have limited applicability. It may be valid during certain stages of some emerging industries (eg, often the early stages). Where the argument is valid, it provides a challenge to the competition authorities to recognise this and not intervene. The legitimate point is that in some industries of the new economy, during certain periods, competition may be so intense and fast that monopoly power simply cannot be sustained for any significant period of time. In these cases, the appropriate antitrust policy may be not to intervene or at least to take a 'wait and see' approach. As a general proposition, however, this is not appropriate for all industries of the new economy at all stages of growth:

C.18 The previous statements have all been from authorities from the United States; however, equivalent statements represent the positions of the competition policy authorities in the UK and the EU as well. John Vickers Director General of Fair Trading in the UK and a distinguished economist stated in a speech earlier this year to the International Competition Policy Conference at Oxford (2001).

...Competition policy has a key role to play in creating and maintaining conditions favourable to innovation. Just as there is no tension between competition and innovation, neither is there conflict between competition policy and innovation. Quite the reverse: competition policy – sensibly applied – is good for innovation...

C.19 He goes on to say:

...The application of competition policy to innovative industries is nevertheless subject to much discussed difficulties. I shall discuss these aspects of those difficulties presently. But first let me declare my solidarity with those who argue that, even if we have a New Economy, it does not follow that we need new principles of economics or of competition law...

C.20 Clearly, Vickers' position is totally consistent with those of his US counterparts and he is clearly aware of the complexities that characteristics of these high-tech industries create for competition policy.

C.21 Similarly, EU Competition Commissioner Mario Monti (2001) in another speech this year on competition policy for the e-Economy concludes:

...Competition rules have not lost their relevance in the e-Economy. The Internet is a wonderful enabling technology, which will in principle, increase competition in many markets. Nevertheless, that does not mean that it is immune from competition problems.

Indeed, the fast growth of the Internet may make it more rather than less susceptible to problems associated with strong positions of particular companies, be it the incumbent telecom operators controlling the local loops, or be it Business-to-Business exchanges controlled by dominant players in an industry.

We shall therefore need to apply competition rules in a sensible and flexible manner to ensure that e-markets remain open and that innovation is not stifled. In this way, competition policy will greatly contribute to the goal that the European Union set itself in Lisbon: to become the most competitive and dynamic knowledge-based economy in the world...

C.22 From this point on, this report takes as given that competition policy and antitrust enforcement have an important role to play in new economy industries. We move from considering the question of whether there is a role for antitrust enforcement in the new economy to the question of how to adapt the antitrust enforcement paradigm to analysing competition issues in the new economy. Thus our focus turns from the analysis of the characteristics of the new-economy industries that are significant to the conduct of competition policy, to the analysis of how to account for these characteristics when analysing competition policy issues in the new economy. While it is widely agreed that competition policy and antitrust enforcement have an important role to play in maintaining effective competition in the new economy, there is less agreement among economists about whether the paradigm for analysing competition issues is well suited for addressing competition issues in highly innovative dynamic industries.

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