

UNIVERSITY OF LONDON

**REFUSAL TO LICENSE:
ABUSE OF DOMINANT POSITION
AND SWITCHING COSTS**

NET LE

**SUBMITTED TO THE LAW DEPARTMENT OF THE LONDON
SCHOOL OF ECONOMICS AND POLITICAL SCIENCE FOR THE
DEGREE OF DOCTOR OF PHILOSOPHY**

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ABSTRACT

The question of this thesis is: “when is the rightholder’s refusal to license a software interface an abuse of dominant position?” Using the principles of law and economics, I will approach this question from the consumers’ perspective. The critical themes of this thesis are the distinction between innovative/non-innovative markets and the role of indirect switching costs of consumers in anti-abuse cases.

Developing the studies of Klemperer (1987) and other authors on switching costs, I hypothesise that a dominant software incumbent abuses his market power if he prejudices consumers without justification. The consumers will suffer a detriment when their switching costs (S) are higher than the maximum utility surplus brought to the consumers by an entrant’s product ($Max \Delta U$), or when the incumbent intentionally raises switching costs without justification. To remedy this, the incumbent should grant the entrant a license to access any interfaces or data formats which could reduce S . A refusal to license may result in an abuse, unless it is justified on the grounds of sunk costs and free riding. The decision to grant should be made by striking a balance between the costs and the benefits of granting access, in a process whereby both the entrant and the incumbent share the burden of proof – the essentiality-justification mechanism.

Cost-benefit analysis, case studies, information system study, game theory, expected utility and probability assessment are the toolkit in this research.

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FORMULAE

$U_1 = u_1 + n_1e, U_2 = u_2 + n_2e; \text{ then } U_2 < U_1 \text{ if } u_2 - u_1 < (n_1 - n_2) e \quad (1)$	41
$S_1 \geq U_2 - U_1 = \Delta U \quad (2)$	129
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<i>Scrabble</i> , HR [1960] NJ 415 (The Netherlands)	79
<i>Tomado v Hazenveld</i> (1953) Hoge Raad NJ 1954, 90 (the Netherlands)	79
<i>Victoria Park Racing and Recreation Ground Company Ltd. v Taylors and Others</i> [1937] 58 CLR	47 182

STATUTES AND DRAFTS

<i>The Berne Convention for the Protection of Literary and Artistic Work</i> , Paris Act 1971	16, 20, 81, 82, 249-256
<i>The Agreement on Trade-Related Aspects of Intellectual Property Rights</i> (TRIPs)	1, 7, 13, 16, 19, 20, 78-81, 95, 243-264, 269, 274, 278
<i>The WIPO Copyright Treaty</i> (1996) (WCT)	253, 254
<i>Treaty for the Establishment of European Union ("EC")</i>	8, 21-29, 35, 103, 117, 215-230, 242, 273
<i>Council Regulation (EC) No 01/2003 on the implementation of the rules on competition laid down in Articles 81 and 82 of the Treaty</i>	215
<i>Rules of Procedure of the EC Court of First Instance</i> OJ [1991] L 136	218
<i>EC Software Copyright Directive</i> No. 91/250/1991, OJ (1991) L 250/42	15, 81, 248
<i>EC Database Directive</i> 96/9/EC, OJ (1996) L 077	185
<i>EC Directive 2001/29/EC dated 22 May 2001 on the Harmonization of Certain Aspects of Copyright and Related Rights in the Information Society</i> , OJ (2001) L/167	85, 252
<i>Directive No. 2002/19/EC dated 17 March 2002 on access to and</i>	128, 129

interconnection of electronic communications networks and associated facilities

<i>Commission Notice on Market Definition</i> OJ [1997] C372/5	57-60, 67, 105, 107, 129, 174, 176, 270, 271
<i>Commission Notice on the Application of the Competition Rules to Access Agreements in Telecommunication</i> OJ [1998] C 265/2	21, 26
<i>Commission Notice - Guidelines on Vertical Restraints</i> OJ [2000] C 291/1	23, 33, 57
<i>Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services</i> OJ [2002] C 165/03	58, 62, 95, 97, 118
<i>The US Constitution</i>	19, 77
<i>US Sherman Act</i> (1890, Title 15 US Code, Sec. 1-7)	21, 26, 29, 36, 63, 88, 221, 237, 279
<i>Telecommunication Act</i> 1996 (Title 47 US Code, Sec. 251-256)	127, 128, 243
<i>US Copyright Act</i> (Title 17 US Code).	21, 85, 256-264
<i>Antitrust Guidelines for the Licensing of Intellectual Property.</i> US Department of Justice and the Federal Trade Commission (1995)	25, 26, 29, 59, 92, 109, 142, 143, 182, 189, 200
<i>The Statute of Queen Anne</i> 1709	18, 19
<i>UK Copyright, Design and Patent Act</i> 1988	18
<i>German Law on Copyright and Neighboring Rights</i> (1965, am. 1985)	18
<i>Singapore Copyright Act</i> 1987 (§§ 38 - 53)	264
<i>Chinese Copyright Law</i> (2001)	266
<i>Vietnamese Civil Code</i> (Part VI – Intellectual Property Rights, 1995)	266

ABBREVIATION

ACM	Association for Computing Machinery
<i>Access Directive</i>	European Parliament and the Council Directive No. 2002/19/EC dated 17 March 2002 on access to, and interconnection of, electronic communications networks and associated facilities.
<i>Access Notice</i>	European Commission Notice on the Application of the Competition Rules to Access Agreements in the Telecommunication Sector [1998] OJ C 265/2.
ALAI	Association Litteraire et Artistique Internationale
API	Application Programming Interface
BJLT	Berkeley Journal of Law and Technology
BGB	Burgerliches Gesetzbuch (German Civil Code)
BIICL	The British Institute of International and Comparative Law
CFI	Court of First Instance
Commission	European Commission
DOJ	US Department of Justice
EC	European Community, or the Treaty for the Establishment of the European Community
ECLR	European Competition Law Review
ECJ	European Court of Justice
ECR	European Court Report
EFD	Essential Facilities Doctrine
EIPR	European Intellectual Property Review
EJM	Essentiality-justification-maximin
EU	European Union
FCC	Federal Communications Commission
Fordham IPLJ	Fordham Intellectual Property, Media and Entertainment Law Journal
<i>Finding of Facts</i>	<i>United States v Microsoft Corp.</i> No. 98-1232, 165 F.3d 952 (D.C. Cir. 1999), Finding of Facts
FTC	US Federal Trade Commission
GII	Global Information Infrastructure
<i>Green Paper</i>	EC Commission Green Paper (refer to the bibliography)
ICT	Information and communication technology

IDC	International Data Corporation
IE	Internet Explorer
IIC	International Review of Industrial Property and Copyright Law
<i>IP Guidelines</i>	Antitrust Guidelines for the Licensing of Intellectual Property, issued by the US Department of Justice and the Federal Trade Commission, 1995.
IPQ	Intellectual Property Quarterly
IS	Information Society
IT	Information technology
JLE	The Journal of Law and Economics
J of ...	Journal of ...
J of. CLP	OECD Journal of Competition Law and Policy
F.	Federal Reporter ... Series (F.2d, F.3d)
F. Supp.	Federal Supplement
<i>GVR</i>	Commission Notice, Guidelines on Vertical Restraints OJ 2000/C 291/01
LJ	Law journal
L Rev.	Law review
<i>Market Notice</i>	European Commission Notice on Market Definition OJ [1997] C372/5
<i>Market Guidelines</i>	Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services OJ [2002] C 165/03
<i>Media Market (Economics)</i>	European Commission (2002) Market Definition in the Media Sector – Economic Issues, Report by Europe Economics, COMP/C2/2001/16
<i>Media Market (Legal)</i>	European Commission (2002) Market Definition in the Media Sector – Legal Issues, Report by Bird & Bird, COMP/C2/2001/16
<i>Microsoft Appeal</i>	<i>Microsoft Corp. v USA and State of New York et al.</i> (2000) 87 F. Supp.2d 30, Opinion of the Court of Appeals for the D.C. Circuit dated 28 June 2001 (the number followed [e.g., <i>Microsoft Appeal</i> : 56] is the page of the opinion).
<i>Microsoft Europe and Microsoft Europe Decision</i>	The investigation of the European Commission into Microsoft's alleged abusive conduct, from 1998 to 2004; and the <i>Decision dated 24 March 2004 on Microsoft</i> (Case COMP/C-3/37, 792, Decision No. C(2004)900 final).
<i>Microsoft US</i>	<i>United States v Microsoft Corp.</i> 165 F.3d 952 (D.C. District Court 1999).
MIE	Micro-Infrastructural Element
MP3	Moving Picture Expert Group, Audio Layer 3

MPEG	Moving Picture Expert Group
MS	Microsoft
NBER	National Bureau of Economic Research
NII	National Information Infrastructure
NY Times	New York Times
OECD	Organization of Economic Co-operation and Development
OECD JCLP	OECD Journal of Competition Law and Policy
OEM	Original equipment manufacturer (normally PC producer)
ONP	Open Network Provision
OJ	Official Journal
OS	Operating System
PC	Personal computer
R&D	Research and development
SSNIP	small but significant non-transitory increase in prices, the name of a test to define a relevant market.
<i>Software Directive</i>	EC Directive No. 91/250/1991 on the Copyright Protection for Software Programmes
TRIPs	The Agreement on Trade-Related Aspects of Intellectual Property Rights
U	University (in bibliography) or Utility (in main text, italics)
US	United States (or United States Supreme Court decisions, official reports)
WCT	WIPO Copyright Treaty
WIPO	World Intellectual Property Organisation (previously BIRPI)
WMP	Windows Media Player
WSJ	Wall Street Journal

GLOSSARY

- Abuse of rights:* an unjustifiable exercise of the rights of a person that creates detriment to another person (see Section 3.2).
- Abuse of a dominant position:* anticompetitive conduct prohibited by Article 82 EC (see Section 1.1.3).
- Article 82 EC:* Any abuse by one or more undertakings of a dominant position within the common market or in a substantial part of it shall be prohibited as incompatible with the common market insofar as it may affect trade between Member States. Such abuse may, in particular, consist in:
- (a) directly or indirectly imposing unfair purchase or selling prices or other unfair trading conditions;
 - (b) limiting production, markets or technical development to the prejudice of consumers;
 - (c) applying dissimilar conditions to equivalent transactions with other trading parties, thereby placing them at a competitive disadvantage;
 - (d) making the conclusion of contracts subject to acceptance by the other parties of supplementary obligations which, by their nature or according to commercial usage, have no connection with the subject of such contracts.
- Barriers to entry:* a factor in a market that permits the *incumbent* to earn monopoly profits (Bain's definition); or a cost of producing, which must be borne by the entrants but is not borne by the incumbents (Stigler's definition).
- Browser:* multimedia software e.g., Internet Explorer, which can access the World Wide Web, the aspect of the Internet that transmits pictures, sound, etc..
- Bundling:* the combining of either network functionalities or end-user services into one integrated package for provision by a supplier to a customer.
- Burning:* the act of copying digital media and storing it into a CD-R.
- Coase theorem:* when information is complete and transaction costs are zero, private and social costs are equal. Therefore, the law should be structured (1) to remove impediments to private agreement, and (2) minimise the harm caused by failure of private agreement.
- Codec:* A piece of code in a media player that implements a compression/decompression algorithm (codec stands for 'coder and decoder').

<i>Consumers:</i>	the users, both companies and individual, who purchase products for the purpose of consumption or business, but not to compete with the seller.
<i>Creative destruction:</i>	the process of innovation, in which old products are replaced by new products, and innovative undertakings prevail over the non-innovative undertakings.
<i>Detriment:</i>	loss or damages caused by an act of an undertaking. Detriment could be a direct loss of a property or a loss of a reasonably foreseeable benefit to the prejudiced party; such as a denial of a reasonable demand.
<i>Downstream market:</i>	also called “after-market”, the market where its functionality depends on the support of an upstream market, e.g., the spare part market is a downstream market, as opposed to the car market (the upstream market).
<i>Efficiency:</i>	the optimal allocation of resources. Pareto efficiency means an allocation that everyone is better off without anyone worse off. Dynamic (Schumpeterian) consumer efficiency means the largest total benefit in the long-term, which is satisfied by a structure that maintain an incentive to innovate.
<i>Essentiality-justification mechanism:</i>	the hierarchy of proof requirement before granting an entrant access to a micro-infrastructural element (MIE): the complainant shall prove the <i>essentiality</i> of MIE access to consumers’ benefit; afterwards the incumbent must <i>justify</i> his refusal to license or other abusive practices. The court will strike a balance between the costs and benefits of granting access before making a decision.
<i>Entrants:</i>	the newcomers to a market, as opposed to the incumbent.
<i>Essential facility and the essential facilities doctrine (EFD):</i>	facility or infrastructure, which is essential for satisfying consumer demand and cannot be replicated by any reasonable means. The essential facilities doctrine specifies when the owner(s) of an ‘essential’ or ‘bottleneck’ facility is mandated to provide access to that facility at a ‘reasonable’ terms to a rival entity.
<i>Externalities (negative or positive):</i>	situations whereby a market player can take an action that affects the well-being of another person but for which it neither pays nor is paid compensation. The first type of situation is negative externality. The second type is positive externalities.
<i>Free riding:</i>	the situation when a person can take advantage or be enriched by another’s effort without repaying the person who has made this advantage available.
<i>Game theory:</i>	a set of formal tools for modelling the behaviour of companies/individuals whose acts are strategically linked with expected payoffs.

<i>Incumbent:</i>	the entity that comes first to a market, as opposed to the entrant (the follower).
<i>Information infrastructure:</i>	a combination of equipment, information, application and software, network standards and people that use information and communication technology to serve society's benefit.
<i>Infrastructure:</i>	a substructure or underlying foundation, common platform or backbone for different products, elements in a products, community or society.
<i>Information layer:</i>	a part of the communication system that together makes communication possible. According to the Benkler-Lessig's model, there are three information layers: content layer (information), code layer (software) and physical layer (hardware). One layer is built upon the other.
<i>Innovation:</i>	in this thesis, it means any technical progress that enhances consumer's utility surplus.
<i>Innovative market:</i>	the market where consumers have reasonable demands for innovative products.
<i>Market failure:</i>	a situation whereby the market fails to adjust itself according to the price information (i.e., fails to produce economic efficiency). This situation calls for correcting the failures and enhancing the economy's efficiency.
<i>Macro-infrastructure</i>	a basic facility in a market that serves the functionality of many products in downstream markets at the same time.
<i>Micro- infrastructural element (MIE):</i>	an element of a macro-infrastructure that either (1) connects the macro infrastructure with downstream markets, making the interaction between two products or two layers possible, or (2) encode information in a content, so that it could interact with other content.
<i>Monopoly /monopsony:</i>	a situation whereby only one firm supplies to or purchases from a market, with no substitutable supplier or buyer.
<i>Network effects:</i>	refers to the fact that networks and standards become more useful the more users there are, of the same product (direct network effects) or of compatible products in related markets (indirect network effects).
<i>New economy:</i>	an economy that is based on information and communication technology.
<i>Non-innovative market:</i>	the market in which there is no reasonable consumer demand for innovation of a particular product or its element.
<i>Opportunity costs:</i>	the loss of utility from exchanging one product with another product.
<i>Oldsters:</i>	customers who have bought the incumbent's product and made investment/

expenditure in relation to it, as opposed to youngsters.

- Probability:* either the ratio between the number of favourable cases and the number of all cases (mathematical probability) or a logical relation between propositions (inductive probability).
- Public goods:* an extreme case of positive externalities, which indicate the goods (e.g., a light) that cost nothing to serve an extra user but cost a lot more to exclude a user.
- Rent:* an opportunity to make profit from negative externalities.
- Ripping:* an act of extracting music or movie tracks from audio and video CDs and converting them to sound file formats, such as MP3, WAV and RAM.
- Sherman Act (1890)*
15 USC §§ 1-2 **Section 1** (excerpt, restraint of trade): every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is declared to be illegal ...
Section 2 (excerpt, monopolisation): every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations, shall be deemed guilty of a felony ...
- Sunk costs:* the costs that firms cannot recover by any means should it exit the market. A firm suffers sunk costs when its opportunity cost is zero (there is no exchange available for the lost expenditure).
- Software:* a set of statements and/or instructions to be used directly or indirectly in a computer in order to bring about a certain result.
- Switching costs:* consumer's costs of switching suppliers. There are two types of switching costs: direct and indirect costs. Direct switching costs are the opportunity costs to be lost because of switching. Indirect switching costs are the sunk costs incurred in relation to the supplied product (section 3.3.1).
- Three-step test:* the three conditions for all exceptions to copyright, set forth in Article 13 TRIPs: (1) exceptions to copyright are only available in certain special circumstances, which (2) do not conflict with a normal exploitation of the work, and (3) do not cause unreasonable prejudice to the legitimate interests of the rightholder.
- Transaction costs:* impediments to private transactions, being the costs of establishing and maintaining property rights, or the costs resulting from the transfer of property rights, including the search cost, information cost, negotiation cost and enforcement

cost.

Utility: the use value of a product/service to a customer.

Utility surplus: the difference/improvement in terms of utility between the new product (U_2) and the old product (U_1), marked as $\Delta U = U_2 - U_1$.

Youngsters: consumers who have not yet bought any products of the incumbent.

INTRODUCTION

MAIN QUESTION AND ISSUES

The central question of this thesis is: “when is a refusal to grant a copyright license an abuse of dominant position in the context of software?”

Copyright is a bundle of many rights; the right that makes it most valuable is the author’s exclusive right to prevent competitors from using his work. As refusal to license is the subject matter of copyright, its limitation should be exceptional. As stated in Article 13 of the Agreement on Trade-Related Aspects of Intellectual Property Rights (“TRIPs”), any limitation of copyright should be subject to a so-called “three-step test”:

- (1) it is granted only in certain special cases,
- (2) it does not conflict with a normal exploitation of the work, and
- (3) it does not unreasonably prejudice the legitimate interests of the rightholder.

Like other private rights, copyright may be abused.¹ As one might think, there must be a provision to prevent such abuse. However, it is hard to define an abuse of rights. A common argument is that an exercise of a private right, such as refusal to license, is abusive when it does not serve its legitimate objective (Paton, 1972: 166). A narrower interpretation, as supported throughout this thesis, is that a rightholder abuses his right when an exercise of the right creates a detriment to others (see section 3.2.1). With respect to copyright, the ‘others’ would mean the employees, competitors, or consumers of the rightholders. As both the rightholder and its competitors claim that they bring benefits to the consumer, the issue is in which case the refusal

¹ Paton (1972: 166) notes: “no legal system can guarantee freedom of the will in general ... [That is why] transactions where there has been gross abuse [such as] duress, undue influence and fraud ... are invalidated.”

to license would 'likely' to harm than to benefit the consumer. If this point is likely to be persistent, then this is where abusive conduct takes place.

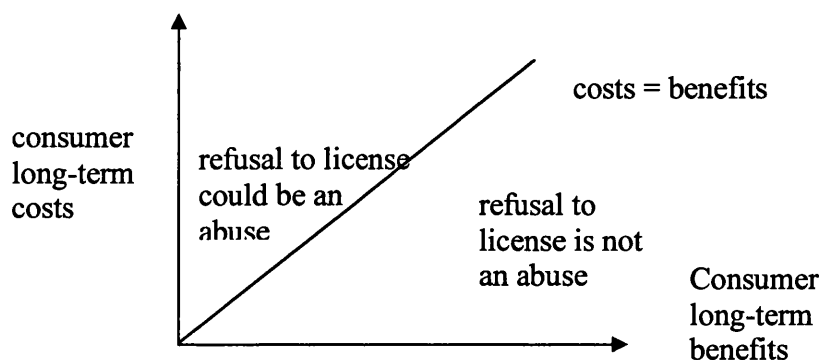


Figure 1: the cost-benefit analysis approach

The literature on the topic of refusal to license covers a number of disciplines: intellectual property law, competition law, economics, information systems, and media and communication. Most studies emphasise the balance between the creation and diffusion of innovation, while focusing less on the interests and the demands of the consumer.

- In the field of copyright law, there are literatures on fair use, the three-step test or exception to copyright, among them major contributions comes from Bainbridge (1999) and Lessig (2001); as well as case law on the idea-expression dichotomy, reverse-engineering and freedom of speech.
- On the aspect of competition law, academic opinion is divided on the issue of abusive refusal to license and its remedy – the essential facilities doctrine (EFD). There are many arguments against this doctrine from Whish (2001), Bork (1978), Posner (1998) and Schmalensee (2000). Supporting arguments are due to the works of many authors, most representatively Anderman (1998) and Rubinfeld (2001); as well as case law in both the European Union and the US.
- In the field of economic studies, discussions concerning the validity of refusal to license can be attributed to whether a facility is privately or publicly managed. Hereafter, the

confliction between arguments for productive efficiency (Chicago School) and the arguments for allocative efficiency (neo-classical school) arise.

- From the technical perspective, there have been studies of information infrastructures by Hanseth (1996) at the micro level and Grove (1997) at the macro level.

The common point in those studies is that interaction in a network economy is crucial; hence, the barriers that prevent interaction should be minimised and compulsory license may be necessary. However, it may stifle innovation. Since it takes a large amount of innovation and effort for a small firm to become a dominant firm, does the government give an incentive to the innovators *ex ante*, and then prevent him to recover his sunk costs *ex post*? Do consumers suffer any detriment because of the incumbent's refusal to license some interface to its rivals?

HYPOTHESIS, COUNTER-ARGUMENTS AND CONTRIBUTIONS

a. Hypothesis and counter-arguments

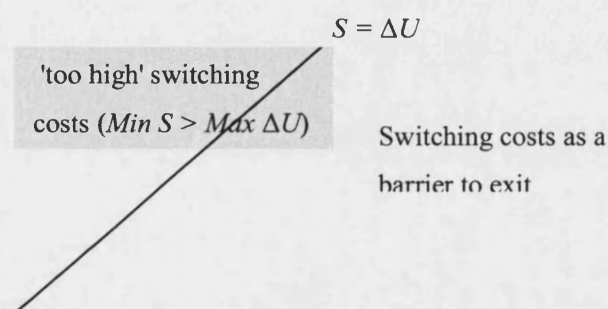
Here, I hypothesise that a software *incumbent* abuses his dominant position when he causes detriment to consumers without justification. Detriment to consumers is proved when a refusal to license infrastructural elements to an *entrant*, namely the critical interfaces and data formats, is the main cause that prevents a *reasonable demand* of both the incumbent's existing consumers ('*oldsters*') and potential consumers ('*youngsters*'). A demand is reasonable if it can bring *utility surplus* (ΔU) to the consumers in a defined market, whilst taking into account the interests of both the buyer and the seller. The concept of a consumer's 'reasonable demand', though useful, is still vague. It does not provide us with a convincing answer to the main question. If the entrant's product were sufficiently better than the incumbent's product, would it automatically attract consumer demand? More importantly, how could a consumer's "reasonable demand" be defined? As we know that consumers want products of the highest quality at the lowest price, are these expectations reasonable, since there is 'no free lunch'? Is a denial of consumer demand a 'detriment', if it allows the rightholder to obtain resources,

innovate and bring about another consumer benefit? There is no point discussing these unless we can identify certain factors, which hinder consumer demand in the long run without giving sufficient benefit in return. These factors are named ‘externalities’ in economic terminology.

The search for the externalities leads us to the concept of switching costs, which pertain to expenditure of changing suppliers. Many authors, such as Von Weizacker (1984), Klemperer (1987) and Nilssen (1992) assert that consumer’s reasonable demand could be denied if switching costs were too high. In this research, I will focus on ‘*indirect*’ switching costs (the costs incurred in relation to the incumbent’s product but do not add benefit to the consumer in return) to highlight the fact that those costs are detrimental to consumers. An example of these costs is the investments of consumers in relation with a standardised product they currently use. If a new product, though better, must adopt a standard incompatible with the current standard, then a switch to such a product will result in the loss of the investments. The old standard is referred to as the ‘micro-infrastructural element’ (MIE) of a market.

As consumers keep investing in the standardised product, switching costs keep increasing and erect a barrier to exit to consumers, as seen in Figure 2 below. When the switching costs are higher than the maximum level of the utility surplus that a new product can possibly bring to the consumers, the barrier to exit becomes permanent. Similarly, when the incumbent intentionally increases switching costs, they can exploit the rent that these costs result in the consumers. If the consumers’ investments in the old product can be reusable in the new product, thanks to the MIE license, a refusal to license would cause consumer detriment and may amount to an abuse. Competition authorities should be able to require the incumbent to grant the entrant access to the MIE, via the essential facilities doctrine (EFD).

Switching costs



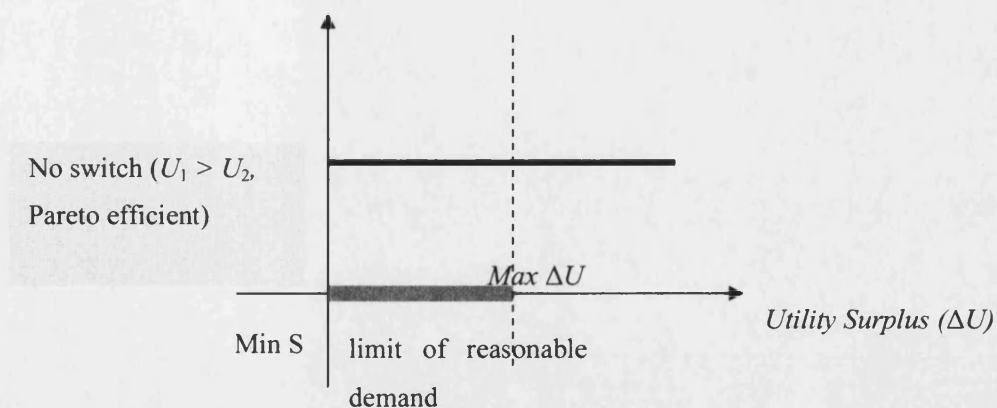


Figure 2: switching costs, barriers to exit and detriment to consumers

There are three counter-arguments against my hypothesis:

- (1) This hypothesis is not new. That is, when an infrastructural element (or a facility) is essential for competition, a refusal to license it obviously destroys potential competition. By definition, it could become an abuse (Goyder, 2003: 516).
- (2) There have been several rigorous challenges to the EFD (e.g., from Jacobs AG in *Bronner v Mediaprint* [1997] ECR I-771 and the Supreme Court in *Verizon v Trinko* [2004] 02 US 682). Many scholars have attacked and tried to remove this doctrine. Is it plausible to resurrect it?
- (3) This hypothesis is interesting because it relates to anti-competitive practices in the network economy, particularly the cases of IBM (in 1980s) and Microsoft (from 1990s to date). However, as Eisenach and Lenard (2003: 17) point out, “it is far easier to conclude that Microsoft is in possession of a standard monopoly, and may even be abusing that monopoly, than it will be to find an appropriate remedy.” The dynamic of the network economy shows that no monopoly is safe for long. Many dominant firms, such as IBM or Xerox in 1980s, are no longer dominant today. Thus, what is the point of legal intervention?

My responses to these challenges are:

- (1) The hypothesis might not be new, but to be applicable within the context of dynamic competition and high diffusion of technology, it needs to be reviewed. The issue of how to make the EFD work in the markets related to intellectual property rights remains unanswered (see e.g., Katz and Shapiro, 1999).
- (2) Although there are failings in the current EFD, this doctrine has been firmly established in both Europe and the US and has been successfully applied in situations where otherwise the market would be permanently monopolised (Goyder, 2003: 541). The weaknesses of the EFD to the intellectual property context are attributed to the errors caused by the implementation, rather than the rationale of the EFD. I aim here to correct the shortcomings in the procedure of the doctrine, particularly the problem of burden of proof. In other words, I seek a procedural rather than substantive balance of interests between the parties.
- (3) There have been many arguments and counter-arguments about what risks ‘may’ or ‘could’ happen if the EFD is applied. However, there have been few analyses of the probability that a hypothetical risk will happen because of the problems in the counter-arguments. Here, I will use inductive probability (within legal sense) instead of mathematical probability. The former refers to the logical relation and balance between propositions (Cohen, 1977). As Shapiro and Varian (1999: 209) and Scolnicov (2000) point out, in reviewing any counter-argument, we must ask three questions:
 - (i) What is the nature of the risk that the counter-argument claims?
 - (ii) Is the counter-argument relevant to that risk?
 - (iii) Will the remedy put across by the counter-arguments bring more surplus than the remedy of the hypothesis?

Some counter-arguments may not pass the first two questions, but the remaining counter-arguments will provide valuable feedback to correct the shortcoming of my hypotheses.

b. Contributions to the literature

This thesis has two goals. Narrowly, it will shed some light on two doctrines applicable to the software sector: the EFD in competition and the three-step test in copyright. Particularly, I aim to clarify the ambiguous ‘exceptional circumstances’ doctrine in European competition law. This task can be done by applying an ‘essentiality-justification’ mechanism, to be analysed in section 5.5, and replacing the impractical three-step test under the TRIPs Agreement with the US fair use doctrine. Broadly, my analysis aims to provide a general insight into the method of perceiving innovation and diffusion of technologies. Starting from the concept of consumer welfare, i.e., consumer benefits minus consumer detriments and the costs of regulation, my arguments are as follows. Firstly, neither innovation nor efficiency has utmost importance if they do not enhance consumer welfare, i.e., consumer benefits and detriments. Secondly, in order to analyse detriment to consumers, it is necessary to pay attention to not only the payoffs of the incumbents or the consumers within a particular scenario, but also the probability that this scenario will happen, and the conditions for this scenario to happen. That is why in Chapters 3 and 4 we use the probability of consumer demand for innovative products to separate innovative markets from non-innovative markets.

METHODOLOGY

a. The approaches that will not be taken

I have employed various methodologies, such as historical, philosophical and case law comparative analysis before setting upon a choice of the multi-disciplinary approach of law and economics.

- Analysis of copyright philosophies with reference to Locke, Hegel or Bentham may shed some light on public interests. However, they are not specific enough to facilitate discussions of the abuse of a dominant position in the digital environment.

- Historical analysis of copyright law can explain how fair use evolves, but shows very little interest in switching costs or network effects.
- The case law comparative approach is only useful in competition law, not in copyright law; because provisions on the exceptions to copyright or fair use/fair dealing pay little attention to the switching costs issue. As will be explained in section 2.2.2, even the provisions stipulating reverse engineering for the purpose of interoperability has proved ineffective to prevent an abuse of a dominant position.

Using the approach of law and economics, there will not be a separate chapter on competition law in Europe versus competition law in the US, or copyright law in the US versus copyright law in the UK. National case law will be considered according to the practical function they serve rather than as the sources of authority. The viewpoint taken is that law is a system of coercion or a price whose violator must pay (see e.g., Blackburn, 1996: 213; Cooter and Ulen, 2000: 7). The difference between EC competition law and US antitrust law should not be material. Provided they stem from the same concern, they should end up doing the same job equally well. This is hardly surprising. Paton (1972: 32) once noted:

“Although man’s views ... have changed as the centuries roll by, nevertheless the element of human interest provides a greater substratum of identity than does to the logical structure of the law. Comparative law frequently illustrates that, while the legal theories of two systems may be as far apart as the poles, each may be forced for reasons of convenience to modify ... that ultimately the practical results are not far removed.”

b. The law and economics approach

The law and economics approach is chosen for a number of reasons. Firstly, the central topic (abuse of a dominant position) involves many economic concepts which are crucial to both copyright law and competition law, such as incentives, free riding, sunk costs, efficiency, creative destruction, market failure, and network externalities. Secondly, as Cooter and Ulen (1997: ix) mentioned, law and economics benefit from the strength of both disciplines:

induction in law (from case study to the development of general theory) and deduction in economics (from a general theory to the analysis of particular instances). Thirdly, the discourse between economics and law offer a toolkit that is not only rigorous but also useful to solve our main problems:

- To identify whether and when a limitation of copyright will enhance consumer welfare, it is necessary to compare the *costs* and *benefits* of copyright limitation versus copyright protection. Our aim is to maximise the benefits while minimising the costs for society by stimulating individual behaviour. As Coase (1997: 27) noted: “the aim of economic policy is to ensure that people, when deciding which course of action to take, choose that which brings about the best outcome for the system.”
- Many of our considerations are *strategic* (what the rightholder does will depend on what he thinks his competitors or consumers will do, and vice versa). Here *game theory* is a useful tool of explanation. For example, if a refusal to license is a credible threat to potential licensees, it should be treated differently from a non-credible threat.² For the same reason, the rightholder might allege that if he licenses the MIE to his competitors, others will free ride on his innovative effort. However, if free riding is unlikely to become a *collective action*, it is not a credible threat.
- Legal reasoning, such as “there is no incentive for innovation if the scope of copyright is limited” or “refusal to license in exceptional circumstances will harm consumers” tends to be more hypothetical than probable. This reasoning would face difficulty if one asks: ‘how realistic is the hypothesis’? To answer this question one needs to analyse *probability*. This principle is well known in economics. Von Neumann and Morgenstern (1944: 25) state that expected utility is a function of both payoff and probability. This thesis will balance costs, benefits and probabilities to judge when a refusal to license would harm consumers.

² According to Baird, Gertner and Picker (1994: 305), a threat is credible when a player has a capacity to punish other players and a willingness to carry out the threat if the latter do not play by the rule/strategy set by the threatening player.

However, the law and economics approach is not flawless. It can be challenged by the following arguments:

- The law and economics approach aims to correct ‘market failures’. It assumes that the state of ‘no market failure’ is attainable, when each player has perfect information about other players and transaction costs are close to zero. In reality, information is limited and transaction costs do exist. If this is the case even in theory, it is clear that law, applied by human beings, equipped with bias and limited information on the consequences of their decisions, is unable to solve ‘market failures’.
- It seems paradoxical to suggest that one could find a rationale for compulsory licensing through an economic theory. Economic theories usually conjecture that a solution to one market failure might result in another market failure (Coase, 1960; Collins, 1997: 27). If copyright is granted, the author’s exclusive right could increase the transaction costs of consumers. However, if the scope of copyright is limited, the risk of free riding could increase the transaction costs of the author.
- The market can hardly explain all dimensions of copyright law. The latter also has key provisions, such as moral rights or social norms (see e.g., Ellikson, 1991: 151). Can the government correct market failure, limit the right to refuse a license and, consequently, affect the author’s moral right?

In response to these challenges, I do not try to defend law and economics as the most feasible approach. However, as abuse of dominant position bears economic implication, using economic theories to analyse law is central to this task. This approach does not undermine the social impact of copyright. It will not affect the integrity of the rightholder to an extent that it expropriates his fruit of labour. A corrective justice approach of Aristotle is adopted, so that a compulsory license would be proposed as the last resort, while the rightholder can agree with

the licensee for a fair access price (see section 5.3).³ As long as the proposal to reform is limited to procedural, not substantive issues, the risk that misjudgement may result in more market failures will be minimised. Moreover, the proposed solution will have a ‘check-and-balance’ mechanism, which can find and correct the judgement defaults if they occur.

c. Contents

This thesis is divided into two analytical groups: infrastructure and superstructure. The infrastructural chapters are Chapter One (abuse of software copyright), Two (current anti-abuse measures), Three (abuse of switching costs in non-innovative markets), Four (abuse of switching costs in innovative markets) and Five (free riding and sunk cost justifications). These chapters establish the ‘original situations’ and explain why my hypothesis could provide a better outcome than the original ones. The superstructural chapters are Chapters 6 (rethinking the essential facilities doctrine) and 7 (rethinking the three-step test). Those chapters discuss to what extent the hypotheses and methodologies in Chapters 4 and 5 can provide insights into the current doctrines on copyright abuse in competition law and copyright law. This structure follows the traditional approach in law and economics, found by Coase (1960):

“A better approach would seem to be to start our analysis with ... approximating what really exists, to examine the effects of a proposed policy change and to attempt to decide whether the new situation would be, in total, better or worse than the original one.”

Chapter 1 illustrates the whole picture that relates to the main question: the right to refuse a license under copyright law, competition law, the roles of micro infrastructural elements (MIEs), and the way MIE control can affect competition in software markets. Chapter 2 provides a literature review of the economic and legal measures that address the issue of MIE

³ According to Aristotle, justice displays itself in two forms. *Distributive justice* hands out honours and rewards, according to the merits of the recipients. *Corrective justice* takes no account of the position of the parties concerned, but simply secures equality between the two by taking away from the advantage of the one and adding it to the disadvantage of the other, such to provide a balanced burden of proof (see Barnes, ed., 1995; Ellickson, 1991: 132-33). For discussion on wealth maximization as the end of law and economic approach and its conflicts with other goals, see Posner (1985).

abuse. I will argue that the paramount issue in abusive conduct is its detriment to consumers. Chapter 3 focuses on two factors: utility surplus and switching costs. I use a simple model (non-innovative markets) to argue that switching costs are high in markets controlled by the MIEs. They affect the demand for utility surplus of both the incumbent's customers and potential customers (oldsters and youngsters, respectively). An intentional increase in switching costs by exercising MIE control is an abuse of the dominant position unless otherwise justified. In Chapter 4, I develop the simple model from Chapter 3 to analyse the impact of high switching costs in a more complicated scenario - innovative markets. The case study will be the markets for server operating systems and media players in the EC investigation against Microsoft.

Chapter 5 challenges the aftermath of the proposals as mentioned in Chapters 3 and 4 from the incumbent's perspectives: free riding and R&D sunk costs risks, after he was ordered to grant a MIE compulsory license. In this chapter, I will limit my aim to discuss solutions and strike a balance between the interests of the incumbent and those of the entrants. The conclusions in Chapters 3, 4 and 5 will then be synthesized in a two-step mechanism "essentiality" and "justification". The entrants must prove that granting access to the MIE is "essential" (Chapters 3 and 4). Afterwards, the incumbent/rightholder should have the right to "justify" the refusal to license based on sunk costs recovery and free riding prevention (Chapter 5). These two steps should be separated and analysed sequentially.

Chapter 6 discusses the practical application of the essentiality-justification mechanism, in order to clarify the ambiguities concerning the current essential facilities doctrine (EFD) in the US and the 'exceptional circumstances' doctrine in Europe. Chapter 7 examines whether the provisions on exception to copyright in the three-step test (Article 13 TRIPs Agreement) hinder the application of the essentiality-justification mechanism. A comparison is made between the three-step test and the US fair use doctrine (Title 17 USC § 107). Hereafter, recommendations will be suggested to the changes in the law, nationally and internationally. In the conclusion, the recommendations suggested in previous chapters will be weighed up with respect to the pros and cons before proposing the implementation and future research.

Each Chapter is ordered dialectically, similar to a discourse. It starts with theses as assumptions or principles. The theses will be challenged by counter-arguments (anti-theses), and then concluded by syntheses. The discussion will focus on two types of consumers ('oldsters' and 'youngsters') and producers ('incumbent' and 'entrants'). References in this research will be primarily taken from EC competition law and US antitrust law. I will not compare the solutions between two jurisdictions and draw a conclusion, but instead will use cases and legislation as examples to support economic theories, pros and cons arguments. As such, in this thesis the terms 'competition law' and 'competition authority' may also include 'antitrust law' and 'antitrust authority', depending on the context and the relevant jurisdiction. Each chapter is structured in the order of topics rather than jurisdictions. Cases will be used as evidence rather than doctrines, thus mentioned briefly. If there are more relevant cases/evidence to support one economic proposal than others, then the first proposal will be favoured in terms of probability, that resembles the fact finding process in court.

The EC and the US are the chosen jurisdictions because they are not only the pioneers in the discussion, but also the jurisdictions where exist the most advanced use of software copyright, doctrines and practices in the fields of abuse of rights. In the field of competition law, there are more analyses of EC cases than the studies of US cases, because the concept of abuse of a dominant position originates from Article 82 EC. Another reason to put EC law in priority is that the thesis intends to suggest a solution for two major cases, pertaining to *Microsoft Europe* and *IMS Health v NDC Health* (case C-418/01) before the European Court of Justice (ECJ).⁴ In the field of copyright law, there will be more US cases than EU cases, because the approach that I support – cost-benefit analysis, is embodied in the US fair use doctrine. As mentioned in subsection (a) above, this thesis does not provide an exhaustive comparative study between EC competition law and US antitrust law regarding refusal to license. Readers will be referred to frequently quoted textbooks, such as Anderman (1998), Raybould and Firth (1991), Goyder (2003), Whish (2001), Phillips and Firth (2001) for details.

⁴

When I was writing this thesis, these cases were still pending decision. Nevertheless, the adoption of the Commission decision on *Microsoft* (on 24 March 2004, decision available on 21 April 2004) and the ECJ judgement on *IMS* (on 29 April 2004) does not change the conclusions drawn herein (see sections 1.5.3, 4.2.2.b, 4.3, 5.5.1.b and 6.2.2 for further discussions).

CHAPTER I: SOFTWARE AND THE MICRO-INFRASTRUCTURAL ELEMENTS

This chapter introduces abuse of a dominant position in the software sector and includes background information on the relevant concepts in laws and economics. Based on Lessig's theory of a multi-layered structure (2000) and Hanseth's theory of information infrastructures (1996), I will argue that policymakers, while mapping out the macro information infrastructure, may have underestimated the impact of the micro infrastructural elements (MIEs) on innovation, competition and consumer welfare. These elements are the critical interfaces and the data formats of standardised software. To assess the risks of MIE abuse and the role of the law in risk governance, the following factors will be analysed: the law (legal infrastructure, section 1.1), the market (economic infrastructure, section 1.2), architecture (technical infrastructure, section 1.3), and norm (social infrastructure, section 1.4).⁵ Section 1.5 analyses the situations where refusal to license the MIE may harm current consumers of the incumbent (the oldsters) and potential consumers (the youngsters).

1.1 COPYRIGHT AND COMPETITION LAW IN THE SOFTWARE SECTOR

1.1.1 COPYRIGHT LAW AND SOFTWARE

Software is a "set of statements and/or instructions to be used directly or indirectly in a computer in order to bring about a certain results."⁶ This definition implies two characteristics. Being statements, software is a written work. Being a set of instructions, software has to

⁵ See the four modalities on public governance of information society in Lessig (1999: 235).

⁶ 17 U.S.C. § 102 (US law). There is no definition of software or computer program under the European Software Directive (No. 91/250/EEC of 14 May 1991), although member states do have their own definition of software.

perform processes, such as to facilitate the interaction between a user and computer, and between software and hardware. As Samuelson *et al.* (1994: 2309) stated, software is not only ‘texts’; it is also ‘a machine’.

The unique feature of software lies in its ‘half-text’, ‘half-machine like’ nature. Intellectual property laws provide protection in two principal areas, ‘texts’ using copyright laws and ‘machines’ by patent and utility solution. However, to find an appropriate regime for half-text, half-machine protection could be difficult. Legislators then have to decide whether they should protect software under copyright, a patent or an utility solution, or a *sui generis* regime.⁷ While the discussion was continuing, unauthorised use of software (piracy) became a major concern, highlighting the need for a quick solution. In 1994, members of the World Trade Organisation (WTO) agreed to treat software as literary work. Software is protected by copyright laws, under Article 10(1) of the Agreement on the Trade-Related Aspects of Intellectual Property Rights (‘TRIPs’).⁸

a. Copyright protection of software

Copyright, as defined in Article 1 of the Berne Convention on Copyright Protection for Literature and Artistic Works (‘Berne’), is the exclusive right to control the use of literary and artistic works, including the right to prohibit others from using the work without authorisation - the right of refusal to license. A work protected by copyright should be an original expression of an idea in a material form. Ideas themselves cannot be protected.⁹

⁷ See Samuelson (1994), Drexl (1994), Hanneman (1986), Phillips and Firth (2001: 344-360).

⁸ For the protection of software with regard to source codes, object codes, interfaces and operating systems under US law, see CONTU (1979) and *Apple v Franklin* [1982] 714 F.2d 1240.

⁹ TRIPs Agreement, Art. 10(2). See also *Kendrick & Co. v Lawrence & Co.* [1890] 25 QBD 99, *Hollingsdrake v Trustwell* [1894] 3 Ch.D. 420 (see Lahore, 1984), *University of London Press Ltd. v The University Tutorial Press Ltd.* (1916) 2 Ch. 601, 608-9 and *Springfield v Thame* [1903] 19 TLR 650 in English law; and *Nichols v Universal Pictures, Inc.* 45 (1930) F.2d 119, 2nd Cir. in US law.

Software protection is in the spotlight not because of its half-text, half-machine like structure, but because of its role in the world economy. Software is present in all manner of devices that people want to improve via digitalisation. Many market surveys have shown the dependency of the world economy on IT and software industry.¹⁰ As software has become a key part of our social structure, Fitzgerald (2001: 47), Naughton (2001: 147), Mansell and Steinmueller (2000: 336-37) say that the matter who controls copyright in critical software will dictate how the world economy would be.

A number of authors, amongst them Stefik (ed. 1999 and 2000) and Denicola (2000) believe that with development of digital rights management (DRM) and other anti-copy technologies, the role of copyright in the software sector will be minimal. Other authors assert that when the government allows software developers to write their own licensing contracts, contract rights would eventually replace copyright.¹¹ These arguments are unconvincing. Technology or contract cannot protect a software developer as strongly as copyright does if a court holds that he has violated competition law. Moreover, property rights are the roots of contractual rights. If a work is not owned, how can it be transferred?

b. Goals of copyright protection

Justice Laddie (1996: 256) remarks that copyright law possesses three goals. The first goal is to prevent free riders (*'thou shalt not steal'*). The second goal is to protect the author's

¹⁰ McKinsey & Co (2002) showed that on the average, IT spending has constituted 20 percent of all corporate expenditure and continued to grow. Studies showed that at least two percent of corporate turnover was spent on IT investment, in which expenditure for software infrastructures took 30 to 40 percent (see e.g., Well and Broadbent, 1999: 340-341).

¹¹ See Lyman (1998), and Mc Gowan (1998) on Article 2B of Uniform Commercial Code. This draft article has been eventually adopted as the Uniform Computer Information Transaction Act (UCITA).

ownership of his fruit of labour. The third goal is to create an incentive to the progress of science and useful arts.¹²

According to Davies (1993) and Firth (1999), the first goal dates back to Queen Anne's Statute (1709). Its preamble stated that copyright should 'protect the Stationers from unauthorised printing'. Hereafter, both civil law and common law countries have chosen a property-focused approach to protect publishers instead of unfair competition, unjust enrichment or criminal sanctions.¹³ Anti-piracy has been the motivation behind the French Decree of 1793 (Geller 2000: 218), the German Copyright Act of 1870 (Spoor, Cornish and Nolan 1980) and the Japanese Copyright Act of 1899 (Doi, 2000). As Ricketson (1986: 19) analysed, anti-piracy has also united countries in international copyright treaties.

The second goal, that copyright protects a fruit of labour, is based on Locke's philosophy. Locke postulated that labour is both the source and the justification for property rights (1690, quoted by Drone, 1879: 15; and Laslett, 1963: 138). Although these property rights are 'natural rights',¹⁴ they do not mean 'unlimited rights'. Locke's philosophy is subject to two conditions: (1) there is enough left over for others (the 'enough-good' condition), (2) no one should own

¹² See also Phillips and Firth (2001: 128-29), Bently and Sherman (2001: 32).

¹³ In *Univ. London Press v Tutorial Univ. Press* [1916] 2 Ch.D. 601 at 610, the House of Lords held that in principle "what is worth copying is prima facie worth protecting." Many countries nowadays define expressly that copyright is a property right (see Article 1 of UK Copyright, Design and Patent Act (CDPA) 1988). In the US, Senator Hatch (1998: 721) also states: "the first principle ... should be that copyright is a property right that ought to be respected as any other property right." For further analyses of the difference between copyright and other property rights, see Kamperman-Sanders (1997), Fitzgerald and Firth (1999). According to Foucault (quoted by Davies 1993: 141), Czarnota and Hart (1991: 138), protection of the work's integrity has led to an economic solution - the author's right to refuse to license.

¹⁴ *Second Treatise, Ch. 5 § 27*: "For, this labour being the unquestionable property of the labourer, no man but he can have a right to what that is once joined to; at least where there is enough, and as good, left in common for others."

more than necessary to avoid waste for the public (the ‘non-waste’ condition). Without these reservations, Locke’s philosophy is weak.¹⁵

The third goal, that copyright is a trade-off between private and public interests, is recognised not only academically but also legislatively, at Article 7 TRIPs:

“The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation, ... to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.”¹⁶

The idea that law is a trade-off between private interests and public interests is deep-rooted in the utilitarianism of Bentham and Ihering.¹⁷ In the context of copyright, the author is granted exclusive ownership rights of his writing, so that he can earn from his own works and at the same time contribute to the progress of science and useful arts. In *Feist v Rural Tel. Serv.* [1991] 499 US 340, Justice O’Connor of the US Supreme Court best described the priority of the third goal over the first two goals of copyright protection as follows:

“The primary objective of copyright is not to reward the labour of authors, but to promote the progress of science and useful arts... This result is neither unfair nor unfortunate. It is the means by which copyright advances the progress of science and art.”

¹⁵⁵ Nozick (1974: 180) asked if he pours a can of tomato juice to the ocean, whether he owned the whole ocean or lost the juice. He emphasized: “it will be implausible to view improving an object as giving full ownership to it, if the stock of un-owned object that might be improved is limited.” See also Strowel (1994: 147 in Sherman and Strowel, eds.).

¹⁶⁶ *Statute of Anne*’s title was “the act to encourage learning,” and US Constitution stated that copyright was granted as incentive to promote “useful arts.” See *Statute of Anne*, Chapter XIX, Section I, US Constitution, Art. 1(8). Hamilton (2000: 323) noted that the US was among the first countries that denied a relationship between copyright and natural law in the case *Wheaton v Peters* [1834] 33 US 591 (for English case, see *Donaldson v Beckett* [1774] 4 Burr. 2408). For a detail discussion of copyright and public interests, see Davies (1993).

¹⁷⁷ For Bentham, see Schofield and Harris (1998: 113) *et seq.*. For Ihering, see Ihering (1888) *Geist des römischen Rechts*, Leipzig: 338, Seignette (1994); and Towse (2001).

Like the second goal, the trade-off argument on copyright is subject to an assumption, that the social benefits from protecting the rightholders will outweigh the social costs. When this objective is attained, copyright also enhances *welfare* of members of society. Otherwise, copyright rather represents a poor bargain.

c. Exception to copyright - the three-step test

Property rights, however sacred or ‘natural,’ are not absolute rights. As Ricketson (1999: 80), Cooter and Ulen (2000: 40-43) mention, the fact that copyright is property rights does not mean that it cannot be restricted. However, since property rights are the fullest private rights, their limitation can only be used as the last resort and to the extent of necessity.¹⁸ To ensure that an exception to copyright will not affect the legitimate interests of the rightholder, Article 13 TRIPs introduces a ‘three-step test’. Particularly, “member countries shall confine the limitations or exceptions to exclusive rights to certain *special cases*, which do *not conflict with a normal exploitation* of the work and do *not unreasonably prejudice* the legitimate interests of the rightholder.” (Emphases added).

The above languages originally apply only to the exceptions of the reproduction right (Article 9(2) *Berne* 1967 revision). Nowadays, Article 13 TRIPs mean that all exceptions available so far under *Berne* and all exceptions currently available must satisfy the three-step test.¹⁹ Thus, when discussing the interface between copyright and competition law, it is vital to mention Article 13 of TRIPs.

¹⁸ This principle - *servitutibus civiliter utendum est* (Digest 8, 1, 9) is firmly established in civil law countries (see e.g., Zweigert and Kotz, 1998). This principle is also confirmed in common law countries, see Murphy and Roberts (1998).

¹⁹ See Gervais (1998: 2.69); Sterling (1999: 351-378); Reinboth and Lewinski (2001). Ricketson (1999:80) argues that Article 13 TRIPs is clearly a *Berne-plus* provision. If it only repeats Article 9(2) *Berne*, it would be redundant, because Article 9(2) is incorporated into TRIPs in any event.

Apart from the three-step test, there is a more flexible doctrine to control exceptions to copyright - the US fair use doctrine (17 USC §107). Under this doctrine, a court can grant a copyright exception if it serves the Constitutional purpose of promoting science and useful arts, after taking into account four factors, which are related to facts rather than law. They are: (1) the purpose and the character of the use; (2) the nature of the copyrighted work; (3) the amount and substantiality of the portion used in relation to the work as a whole; and (4) the effect of the use on the market value of the copied work.

1.1.2 COMPETITION LAW AND AND REGULATORY APPROACHES

a. Consumer welfare as the aim of competition law

Most national competition laws follow one of the two models: US antitrust law and EU competition law. Both laws are built by negative governance, i.e., they outlaw anti-competitive conduct; rather than positive instructions as to what might constitute pro-competitive conduct.²⁰ Anticompetitive conduct may be subdivided to: (1) agreement to restrain competition, (2) abuse of dominant position, and (3) concentration. Of these, the prohibition of abuse of dominant position, seen in Section 2 Sherman Act and Article 82 EC Treaty, is related to the topic of refusal to license (see the Glossary above).

²⁰ For US law, see Sherman Act 1890 (restraint on trade, 15 USC §§ 1-7), Clayton Act 1914 (concentration, 15 USC §§12-27), Robinson Patman Act 1936 (discrimination, 15 USC §13). For EC law, see Article 81, 82 and 86 of the EC Treaty and implementing directives. EC competition usually sees Article 81 EC separated from Article 82 EC, but the overlap between the areas cannot be ruled out, see *Masterfood* [1998] 5 CMLR 530. As such, Goyder (2003: 327) notes that remedies of Article 82 EC can learn from the lessons from Article 81 EC when appropriate (see section 3.1.2 below).

If copyright law encourages private investment in innovative activities, competition law provides the prerequisites for such innovation, toward the end of promoting consumer welfare²¹ Note however that consumer welfare is different from consumer protection. The latter refers to legal protection against conduct that causes damages to consumers, and the objective of the law is to make good these damages. Consumer protection is governed mainly by the laws of contract or tort. Consumer welfare is a concept in welfare economics, like social welfare, which indicates the benefits that consumers obtain from acts minus the harms done and the costs of enforcement of law (Shavell, 2004: 575, 577, 595).

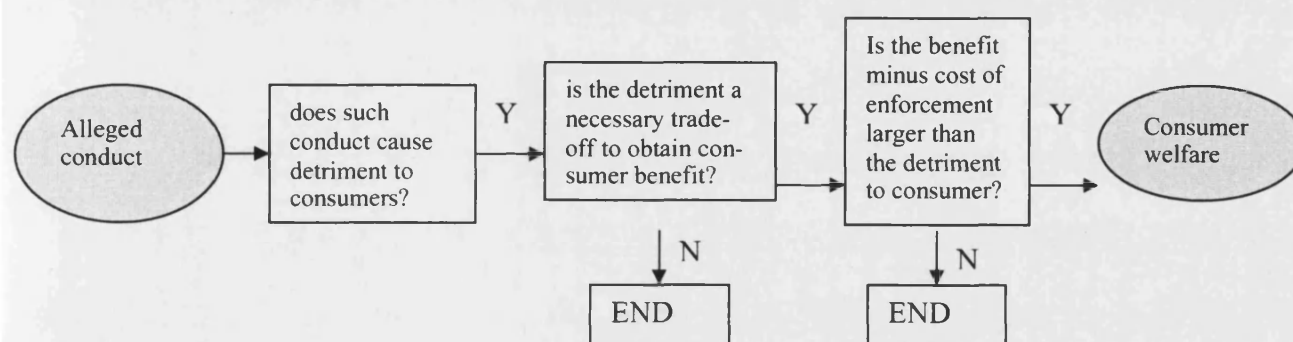


Figure 3: the road from consumer detriment to consumer welfare

Landes and Posner (1998: 326) note: “for copyright to promote economic efficiency, its principal legal doctrine must, at least approximately, maximize the benefits for creating additional work minus both the loss from limiting access and the costs administering copyright protection.” As such, for consumer welfare to be achievable, not only the detriment but also the benefit to consumers should be taken into account. Vice versa, Coase (1997: 155) also remarks: “the benefit of exercising a right ... is always the loss which is suffered elsewhere.”

²¹ The US have highlighted consumer welfare as its major antitrust policy since 1980 (see e.g., Kovacic and Shapiro, 2000; Ewing, 2003: 227-28). In European Union AG Warner in *Commercial Solvents* [1974] ECR 250-1, para. 42, demonstrates that ‘abuse’ is not conduct that causes detriment to the competitors, but instead, “detriment to consumers, whether direct or indirect.” In UK, the Competition Commission starts investigation only when public interests are at stake (section 84 Fair Trading Act 1973; Whish, 2001: 374-75). As a matter of politics, governments are also eager to protect consumers in order to win voters’ support (Harvey and Parry, 2000: 24).

Both the neoclassical (Keynes, 1936)²² and the Chicago School of economics (Bork, 1978: 405; and Ewing, 2003: 229) agree that consumer welfare should be the most important policy that drives competition law, since investment and innovation are funded and motivated by consumer spending.

In addition, EC competition law also seeks another goal, which is to achieve the Single Market Imperative.²³ It is therefore necessary to consider whether this imperative affects the outcomes when comparing a EU case with its US counterpart.

b. The S-C-P paradigm

The main concern of competition law is to limit the negative impact of monopoly, through either creating a competitive market structure, or controlling the anti-competitive behaviour of the monopolists. The theory on the relationship between market structure (*S*), firms' conduct (*C*) and market performance (*P*) originates from Bain (1968, entitled the *S-C-P paradigm*). Viscusi *et al.* (2001: 61) has modelled the paradigm, in which the market structure will affect firms' conduct and ultimately their performance, as seen in Figure 4 below. Two thousand years before Bain, a Chinese general, Sun Tzu, in the *Art of War* also demonstrated that by analysing seven preliminary questions, including the circumstances, the structure and the potential of the armies, he could forecast victory or defeat even before the battle starts (para.

²² According to Keynes increase in consumption will increase society's demand for manufacturing and make the economy more efficient. Let denote $Y = C + S$, and $Y = C + I$, or $\Delta Y = \Delta C + \Delta S = \Delta C + \Delta I$; where Y is social yields, C is social consumption, S is social saving and I is social investment. From the formulae above, $S = I$; therefore $\Delta I = \Delta S = \Delta Y - \Delta C$. Let denote the index $k = \Delta Y / \Delta I$ as the increase in yields by a certain amount of investment. We have $k = \Delta Y / (\Delta Y - \Delta C) = 1 / (1 - \Delta C / \Delta Y)$. As such, the larger ΔC , the larger k . In other words, consumption will make investment more profitable, i.e., more efficient.

²³ In *Commercial Solvents* [1974] ECR 223: para. 6, the ECJ notes: "Article [82] covers abuse which may directly prejudice consumers as well as abuse which indirectly prejudices them by impairing the effective competitive structure as envisaged by [the Single Market imperative – Art. 3(f) EC]." Guidelines on Vertical Restraints (GVR), at para. 7 notes: "market integration is an additional goal of EC competition policy [apart from competition protection]... Companies should not be allowed to recreate private barriers between Member States where State barriers have been successfully abolished."

13). Competition, in a sense, is a war among competitors. They plan their performance and conduct according to market structure. When the structure changes, the plan will be modified.

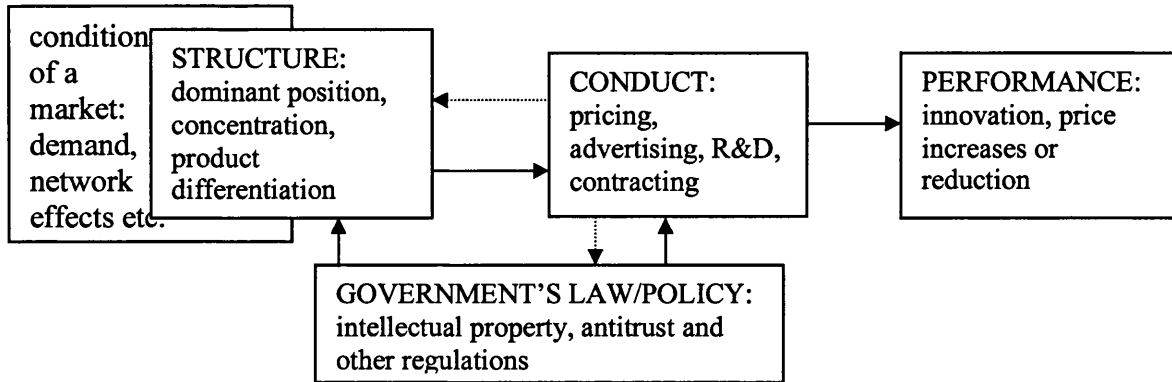


Figure 4: the S-C-P Paradigm

Obviously, it is not to say that market structure is the only explanation for conduct of an undertaking. Other market circumstances such as consumer demand for innovation or network effects also play their roles (Scherer and Ross, 1990). However, an orthodox thinking is that while the circumstances such as consumer demand or network effects are difficult to regulate, one may improve performance by regulating market structure or conduct. For example, by allowing more firms to compete in a market, the incumbent will have to improve its performance and consumers will benefit.²⁴ Friedman (1962, Chapter 7) reminds however that structural regulation should be the last resort, because conduct regulation affects firms' performance more directly than structural regulation. OECD (1999a: 180) also notes that conduct regulation is less risky than structural regulation, as the former can be reversible while the latter hardly does.

²⁴

For the ECJ's ruling on the influence of market structure on the firm's performance, see *Hoffman-La Roche* [1979] ECR 461. Regarding the application of *S-C-P paradigm*, see Gellhorn (1980: 130).

c. Substantive rules vs. procedural rules

Structural or conduct regulations are substantive rules. Could consumer welfare be equally achieved by procedural rules? These are the rules on the burdens of proof among the parties in a competition investigation proceeding or an antitrust litigation. By virtue of Figure 3 in section 1.1.2.a, I argue that it is possible. If consumer welfare is determined by two major factors, consumer detriment and consumer benefits, then a court can consider most ‘substantive rules’ as derivatives of a unique principle: cost-benefit analysis. Therefore, the court can design an appropriate procedural rule that facilitates the cost-benefit analysis process and arrive at the same conclusion as if it has taken a substantive rule, provided that the standard of analysis is rational. In a court proceeding, the burden of proof deals with procedural rules, the standard of proof deals with substantive rules. Chapters 3, 4 and the first parts of Chapter 5 will explore the appropriate standard of cost-benefit analysis with respect to refusal to license cases in the software sector, while section 5.5 will propose a procedural rule that facilitates the proposed standard of analysis.

Cost-benefit analysis is the rationale behind one of the most common procedural rule under US antitrust law: *rule of reason*. In *Standard Oil v US* [1911] 221 US 1, the Supreme Court held that except for prohibited conduct (the *per se* rule), any anti-competitive conduct could be defensible under the rule of reason.²⁵ This rule allows dominant undertakings to apply anti-competitive practices if it can prove that the consumer benefits from these practices are higher than the costs. Under the rule of reason, the plaintiff bears the burden of proof that the defendant’s practice generates benefits to consumers, and the defendant bears the burden of proof that its practice bring more benefits than detriment to consumers (see, e.g., *US v Alcoa* [1945] 148 F.2d 416).

²⁵ Goyder (2003: 127). See also *IP Guidelines: 3.4*, *FTC v Indiana Federation of Dentists* [1986] 476 US 447; *NCAA v Board of Regents of the University of Oklahoma* [1984] 468 US 85; *BMI v CBS* [1979] 441 US 1; Raybould and Firth (1991) and Monti, G. (2003: 19-21). In *per se* cases, the restraints are so plainly anti-competitive, that they are unlawful *per se*, see *FTC v Superior Court Trial Lawyers Association* [1990] 493 US 411. These include price fixing, output restraints, certain group boycott and resale price maintenance. Other cases are subject to the rule of reason.

1.1.3 ABUSE OF DOMINANT POSITION AND COMPETITION ON THE MERITS

a. Abuse of dominant position

Under EC competition law, ‘abuse’ in English or ‘*exploitation abusif*’ in French. Article 82 EC states: “any abuse by one or more undertakings of a dominant position within the common market or in a substantial part of it shall be prohibited as incompatible with the common market insofar as it may affect trade between Member States.” Because the above provision uses the term “one or more undertakings”, an abuse can be originated from one or many (collective) dominant firms. Hence, the concept of ‘abuse’ is comparable with either Section 1 (prohibition of multilateral restraint of trade) or Section 2 (prohibition of unilateral monopolising conduct) of the US Sherman Act.²⁶ There are two similarities between US antitrust law and EC competition law. They both focus on unilateral conduct of dominant firms and analyse the effect of the incumbent’s conduct on the competition of the market(s).²⁷ Both use the same tests to ascertain abusive conduct: define a relevant market; assess market power, the object and the effect of the incumbent’s practices.²⁸ The only difference is that abuse of dominant position under Article 82 EC is an *objective concept*, as stated in para. 91 of *Hoffman-La Roche* [1979] ECR 461 whereas Section 2 Sherman Act requires a monopolising act to be guided by an anti-competitive *intention*. In reality however, the US courts pay more attention to anti-competitive effects and ‘pro-competitive justification’, rather than mere intentions (see e.g., Raybould and Firth, 1991: 111-112, *Aspen Skiing Co. v Aspen Highlands Skiing* [1985] 472 US 585, 603).

²⁶ To be exact, Article 82 EC requires an abusive conduct to affect trade between Member States, and Section 2 Sherman Act requires monopolising conduct to restrain inter-state commerce to be actionable (see the Glossary above). However, the ‘inter-state’ factor is used only to justify the involvement of a supra-national or federal legislations rather than national law or state law. This factor is less important for the purpose of our discussion and is omitted to keep the generality of the theme.

²⁷ For US Antitrust law see Raybould and Firth (1993), Viscusi et al. (2000). For EU Competition Law see Korah (1992) and Whish (2001).

²⁸ These tests will be analysed in detail in section 1.5. Regarding the application of this test in US law, see *IP Guidelines, Sec. 2.2*. For EC law, see *Access Notice* and *Market Notice*.

Two major categorisations of abusive practices are those of exclusionary and exploitative conduct (see e.g., Goyder, 2003: 283), and those of pricing and non-pricing conduct (*Access Notice*, 17-19, para. 105-06; Whish, 2001: Chapters 17 and 18).

- (1) Exclusionary conduct affects market structures, such as the denial of the entrants' access to essential facilities. Exploitative conduct aims directly at exploiting consumers, such as the imposition of excessive prices or unreasonable terms and conditions.
- (2) With respect to the second taxonomy, pricing practices include unfair pricing (excessive or predatory pricing) or unjustifiable price discrimination.²⁹ Non-pricing practices include market sharing, quantitative restriction, refusal to supply, tie-in and bundling.³⁰

Refusal to supply or refusal to license is our main discussion point. On the one hand, the rightholder can refuse to license his protected work.³¹ On the other hand, competition law does not allow the exercise of such exclusive rights to harm competition in the market (Phillips and Firth, 2001: 410). These two objectives do not conflict each other. Both copyright law and competition law share the common purpose of promoting innovation and consumer welfare. However, the difficulty is to draw the line between use and abuse.³² Many authors have tried to

²⁹ See *Deutsche Post* OJ [2001] L 125/27, Hancher and Buendia Sierra (1998: 901). Other pricing practices, such as cross-subsidisation do not trigger competition law, unless they are construed as one of the listed practices defined by Article 82(b) EC.

³⁰ The terminology, which originates from US antitrust doctrines, corresponds with certain provisions in Article 82: price fixing or unfair trading condition (82.a), market sharing and quantitative restriction (82.b), price or non-price discrimination (82.c), tying arrangement (82d). See Whish (2001: Ch. 17 and 18).

³¹ The ECJ in *Volvo v Veng* [1988] ECR 6211 concluded that the right to exclude competitors from using a protected work was "the very subject-matter of copyright." In *US v Colgate & Co* [1919] 250 US 300, the Supreme Court also found that antitrust law does not restrict the right of a business entity to "freely exercise his independent discretion as to the parties with whom he will deal."

³² Korah (1992: 14) argues that perceived *ex post*, a rightholder abuses his exclusive rights where he use it to exclude competitors. Perceived *ex ante*, had there been no guarantee for such exclusive rights, he would have not invested and innovated in the first place. See also Heinemann (2000) for further details.

define where the line may be drawn, among them Govaere's *The Use and Abuse of Intellectual Property Rights in EC Law* (1996) and Lessig's *The Future of Ideas* (2001) propose the most extensive solution.³³ Both criticise competition law and turn to copyright law for a solution.

Govaere (1996: 222 *et seq.*) introduced the concept of 'abusive grant'. She hypothesises that when copyright is granted without promoting any innovation, such a grant is unjustified and abusive. Govaere used *Magill* [1995] ECR I-743 as a case study for her hypothesis. Three broadcasters (RTE, ITV and BBC) held copyright in their television listings. They used this right to refuse to license *Magill* (a publisher) to produce combined listings in one television guide. According to Govaere, copyright has been abusively granted in *Magill* (see section 1.1.2 above). The law has rewarded the rightholder for his innovation in the television program by the broadcasting right. By protecting the program listing, copyright rewards the authors twice. The scope of copyright should therefore be narrowed to protect only the works that serve the copyright's functions, i.e., to reward the labourers and to provide an incentive to innovate for the authors (see section 1.1.1.b).

Lessig (2001: 35) discusses the concept of a 'creative common' - a reserved area that should exist in all copyrightable works, especially in software and digital contents. Before the concept of creative common emerged, Lange (1980) had formulated a similar idea entitled the 'public domain'. Lessig, based on the model of Grove (1997: 42), hypothesises that IT industries are built in layers: the physical layer (hardware), the code layer (software) and content (see Figure 5). The arrows represent the interaction between the layers or among the products within the same layer. In this structure, software is written by codes. Control over the codes can lock the consumers in and harm the 'creative common'. To avoid this risk, it is vital to (1) reduce the scope of copyright, and (2) enlarge the scope of fair use.

³³ See also Senftleben (2004) for an insight on this matter.

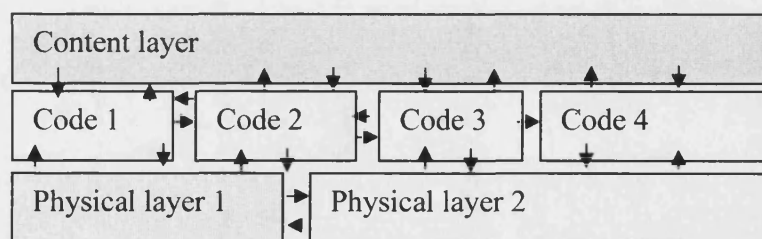


Figure 5: the Lessig's tri-layer model

The courts in the EU and the US have not implemented the proposals of Govaere or Lessig. Instead, they have followed the traditional approach: define the market, assess market power, and estimate the effect of the refusal to license upon competition in the market (see e.g., Whish, 2001: 149-162; Goyder, 2003). A refusal to license copyright per se does not affect competition, because the entrants are not prohibited from using a substitutable expression. However, a refusal to license an interface between two layers could be abusive if the incumbent is capable of maintaining prices above, or output below, competitive levels for the significant period of time (see e.g., *IP Guidelines*, Sec. 2.2 (US law)). In other words, the incumbent possesses market power.

The shortcoming of the arguments of both Govaere and Lessig is that they do not narrow the scope of proposals to the undertakings that hold dominant market power. Section 2 Sherman Act and Article 82 EC Treaty do not govern all undertakings, only the dominant ones (see e.g., Goyder, 2003: 311). The ECJ in *Michelin v Commission* [1983] ECR 3461: 57 affirms that a dominant undertaking “has a special responsibility not to allow its conduct to impair or distort competition.” This is an exception to the principle that undertakings possess freedom to maximise their profits. According to Advocate General (AG) Krischner in *Tetra Pak I* [1990] ECR II-309, there are “commercial steps which might be open to undertakings without a dominant position were, when effected by a dominant company, to be treated as abuse of its power.” (See Goyder, 2003: 311).

b. Competition on the merits

Even though there is little doubt that a dominant undertaking should act with a greater responsibility to the public than non-dominant ones, Bork (1978: 59) and Whish (2001: 162) dispute that whether the ‘special responsibility’ is a pretext to require dominant undertakings to refrain from the behaviour attributable to superior efficiency. To distinct lawful from unlawful monopolization, US antitrust law introduces a concept of ‘competition on the merits.’ That is, if an incumbent holds monopoly power because of competition on the merits, in normal course of doing business, competition law would not sanction its conduct.³⁴ To give examples of competition on merits, in *US v Grinnell* [1966] 384 US 563: 571, the Supreme Court held: “[monopolisation includes] the wilful acquisition or maintenance of [monopoly] power *as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident.*” (Emphases added). In Europe, the policy to promote competition on the merits is confirmed in *Hoffman-La Roche* [1979] ECR 461. At para. 91, the Court defines abuse as:

“an *objective* concept in relation to the behaviour... [which] through recourse to methods *different* from those which condition normal competition in products or services on the basis of the transactions of commercial operators has the effect of hindering the maintenance of ... competition still existing in the market.”

Hence, to determine when monopoly power is achieved on the merits and when it is arrived by anticompetitive conduct, one needs to access the economic impact of monopoly in both the short term and the long term, upon both the existing consumers (oldsters) and the potential consumers (youngsters). As competition law is underpinned by economic concepts, one cannot draw the line between use and abuse in competition law by reference only to case studies.

³⁴ The Supreme Court in *Verizon* [2004] 02 US 682 also emphasized: “to safeguard the incentive to innovate, the possession of monopoly power will not be found unlawful unless it is accompanied by an element of anticompetitive *conduct.*”

1.2 RELEVANT ECONOMIC CONCEPTS

1.2.1 FREEDOM OF CHOICE AND EFFICIENCY

a. *Pareto efficiency and Schumpeter efficiency*

The concept of efficiency starts from an assumption that a human being wants to maximize his wealth, which in turn leads to an increase in the wealth of society.³⁵ 'Pareto efficiency' is achieved when "everyone is better off and no one is worse-off" (see e.g., Cooter and Ulen, 1997: 12). Poundstone (1992: 52) explains this outcome in the following cake-division game:

Two children divide a cake between them by the rule "I cut you choose." If the cake is valued at the same utility to both, it is unwise for the first child to cut the cake unequally (as the second child will choose the big slice). Hence cutting the cake by half is the 'Pareto efficient' strategy.

With regard to this game, consumers can be denoted as the 'chooser' and suppliers can be the 'cutter', efficiency is reached when the 'cutter' is conscious that the 'chooser' will pick the bigger part of the cake given that he had the freedom of choice. As the consumers will choose what is best for their interests, suppliers must compete to satisfy consumer demand.

When there is little impediment to private transactions (low transaction costs), the players will allocate resources according to consumer's choices, not to property rights. The postulation that freedom of choice and low transaction costs will allow economic agents to reach a solution that promote efficiency, regardless of property rights allocation, is called the Coase theorem.³⁶ Coase (1997: 105-08) illustrates his hypothesis by the case *Sturges v Bridgman* [1879] 11 Ch. D. 852. A doctor sued a confectioner for nuisance, as its noise and smell had prevented him

³⁵ See e.g., Stiglitz and Driffill (2000: 24), Cooter and Ulen (2000: 18-27).

³⁶ This term is used by Stigler (1966: 13; from Coase, 1960). See Posner (1998a: 14), Medena and Zerbo (1999: 837). For the critics of the Coase theorem, see Le (2004).

from practising. Although the court held for the doctor, Coase demonstrates that the outcome would be the same regardless of how rights were allocated. Who gets the most benefits from the consumers would compensate those who get less. Either the confectioner can pay the doctor, so that he could continue emitting noise, or the doctor can pay the confectioner so that he could continue enjoying quiet. The payment is possible because the ultimate payer, the consumer, will choose the most efficient product. As long as the consumer enjoys freedom of choice, he would help all players to achieve efficiency.

In a perfectly competitive market, undertakings can only stop competing at the ‘*equilibrium*,’ when the price is equal to the marginal cost (the cost that makes one unit of a product; also called Bertrand competition, see e.g., Cooter and Ulen, 2000: 29-31). However, equilibrium is rarely achieved or even maintained at a consistent rate (see e.g., Soros, 2000: 63; Pindyck and Rubinfeld, 2001: 579). As a supplier has insufficient information on the quantity of other manufacturers’ products, it may deliver too much or too little. Similarly, as consumers do not have information on how other consumers are paying for the product, they may pay too much or too little. There is also no guarantee that the consumers will buy the total quantity supplied, so that the suppliers can make profits. Bork (1978: 59-60) warns:

“George Stigler ... lists four conditions under which a competitive market will normally arise: perfect knowledge; large number [of consumers]; product homogeneity; and divisibility of output. [But a competitive market] is utterly useless as a goal of law ... [for it] would entail an unbelievable loss in national wealth for no particular purpose.”

In contrast to the Pareto efficiency, Schumpeter (1942) postulates that efficiency is achieved not by price reduction but by creating new products (creative destruction). The essence of creative destruction is that the consumer demand for innovative products is a pressure in itself without any push from competitors. Even dominant firms may be driven out in the market if they are no longer cost-efficient and innovative.³⁷ As Grove (1997) illustrates, in this Darwinian struggle for survival, only the fittest survive. They gain natural monopoly position

³⁷ Schumpeter (1942: Chapter 4): “The incessant tendency toward large institutions attacks the very institutional framework of the capitalist order itself: private property and free contracting.”

through competing on the merits. They should also gain monopoly benefits in order to recover their research and development expenditure (R&D).³⁸

Notwithstanding the differences between Pareto and Schumpeterian efficiencies, they share a common understanding. That is consumer demand will drive efficiency. Only when there is a practical freedom of choice, the consumers may counter-balance the incumbent or the entrant, so that the latter must supply products that serve consumer interests (see e.g., McKnight, Waller and Katz, 2001: 221).

b. Allocative efficiency and productive efficiency

Apart from Pareto and Schumpeterian efficiencies, there is also another classification method: productive and allocative efficiencies. According to Whish (2001: 3), allocative efficiency is the best allocation of resources that consumers can make between different goods and services. In essence, allocative efficiency enhances consumer welfare (see Figure 3 in section 1.1.2 above, and *GVR*, para. 7). When consumers have freedom of choice, allocative efficiency is achieved automatically. Productive efficiency, as Viscusi *et al.* (2001: 77-81) demonstrate, is achieved when firms can achieve more output from the same input.

As profit-maximizers, a market player obviously has an incentive to seek productive efficiency, “as if each leaf deliberately sought to maximise the amount of sunlight it receives” (Friedman, quoted by Bork, 1978: 120). However, they do not always have an incentive to achieve allocative efficiency. Alexander Graham Bell’s patent on telephone technology no doubt enhanced productive efficiency at his company, AT&T, but this efficiency had not passed

³⁸ Moreover, there are economies of scale in natural monopoly firms. Stigler (1968: 69) notes: “a superior entrepreneur operating with diseconomies of scale may monopolise an industry because his costs are below those of all potential rivals.” See also Bork (1978: 118).

to consumers for nearly twenty years.³⁹ As such, monopoly may favour productive efficiency but not allocative efficiency. According to Viscusi *et al.* (2001: 351), Schumpeterian competition is generally pro-productive efficiency and Pareto competition is pro-allocative efficiency. Whether competition creates productive efficiency or innovation creates allocative efficiency is unclear, as seen in Table 1 below.

Table 1: productive and allocative efficiency

		RESULTS	
		Productive efficiency	Allocative efficiency
TYPES	Pareto	Unclear	Achieved (by equilibrium)
	Schumpeter	Achieved (by innovation)	Unclear

Nevertheless, allocative efficiency and not productive efficiency is the aim of society's optimisation. Adam Smith (1776) said: "the interest of the producer ought to be attended to only so far as it may be necessary for promoting that of society." When the market fails to reach allocative efficiency by itself, it suffers from '*market failures*' (see Stiglitz, 2001: 229; Pindyck and Rubinfeld, 2001: 611). The monopoly problem and efficiency can be illustrated by a simplified chart, by drawing three curves in Figure 6 below.

The first curve is the demand curve (dd); which shows the different prices at which consumers will buy the supplier's product. The second curve is the total average cost (AC), which denotes the cost of producing each unit of the product. AC is the average of fixed cost – the cost of making the first unit, such as R&D, capital investment; and marginal cost - the cost of making an extra unit. The third curve, the marginal revenue (MR), shows the different prices at which the monopolist will limit its quantity of production.

³⁹ Lavey (1987: 171, 178) observes that between 1876 and 1893, Bell's average return on investment was 46 percent, more than enough to recover the costs of research and development (R&D), but it did not extend

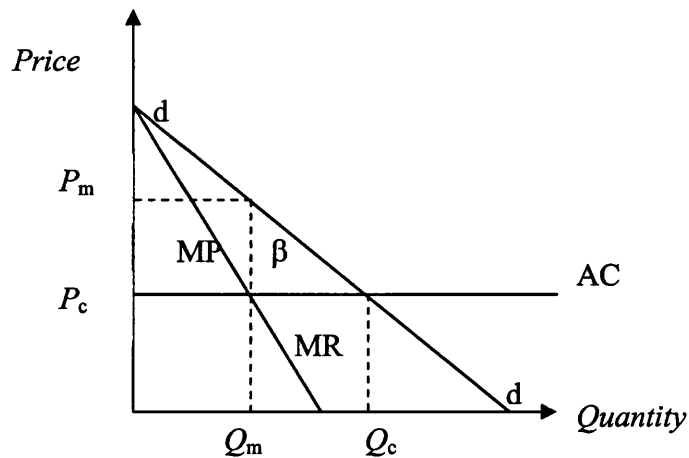


Figure 6: monopoly and efficiency

In a perfect competitive market, firms will compete to sell products until the price equilibrium is reached, to be equal the total average cost (see the Cake-cutting Game in section 1.2.1). The total revenue of suppliers will be $R_c = P_c Q_c$. When a market is monopolised by a single supplier, he will limit his quantity of production to Q_m , thereby set the price at P_m and gain a revenue of $R_m = P_m Q_m$. The monopoly profit will be equal to the rectangular MP . Society will have a *deadweight loss* to monopoly, which is the triangle $\beta = (Q_c - Q_m) \times (P_m - P_c) / 2$, which is under-supplied by the monopolist (see Posner, 1998b: 237). The root of monopoly is in the lack of choice of the consumers, which force them to accept the price P_m .

c. The economic legitimacy of anti-abuse measures

Against the arguments on market failures, Bork (1978: 104-05) counter-argues that productive efficiency will lead to allocative efficiency. A relatively more efficient firm can offer better products to consumers than other firms, and the consumers will obviously choose its product because “a free market system assumes that consumers define their own welfare” (*id*). The discourse of priority between allocative and productive efficiency has divided economists

telephones into less profitable areas. The number of phones in service had increased only 6.3 percent and plant investment had grown only 8.2 percent annually.

into two major schools: Chicago (e.g., Coase, Stigler and Friedman) and Harvard-Freiburg (e.g., Bain, Samuelson and Stiglitz; see Whish, 2001: 18). According to Schmidt and Rittaler (1989), the Harvard and Freiburg Schools aim to achieve allocative efficiency in the short or medium term, following the Pareto efficiency in the cake-division game (see section 1.2.1).⁴⁰ The Chicago School criticises this goal for being ‘over-ambitious’, and infeasible. Instead of cutting a small cake equally, it is better to make a bigger cake in the long-term, and each party gets a larger slice. Productive efficiency takes priority over allocative efficiency. Posner (1998b: 52), following Schumpeter’s theory, says that a sacrifice of short-term efficiency for long-term efficiency might be inevitable. Similarly, exclusionary practices are inevitable even in competitive markets. Bork (1978: 137) remarks that all business activities have some exclusionary effects. Exclusion and foreclosure are the mechanism by which competition confers its benefits upon society. The antitrust concern, as Posner (2001: 251) argued, should be “methods by which [a dominant firm] seeks to ward off new entrants.”

According to Kovacic and Shapiro (2000), the Chicago School has become influential in US courts since the 1980s following the work of Bork and Posner. This School has been gaining more support in Europe thanks to the advocacy of Korah (1992) and Whish (2001), among others. According to Whish (*id.*: 18), “the two ideas [efficiency and equity] sit awkwardly together, ... since an efficient undertaking will inevitably be able to defeat less efficient competitors.” This argument is originated from Stigler (1968), who postulates that competition is not the end in itself. It is the means to achieve efficiency. Thus, if the end justifies the means, we can compromise the market competitiveness for greater consumer benefits.

While Chicago School strongly emphasises that productive efficiency should be the only goal of competition law; neither the Sherman Act nor the EC Treaty mentions the word ‘efficiency’ in their provisions. The word ‘efficiency’ in itself bears no particular meaning if we do not define ‘efficiency for whom and in what circumstances’. As presented in section

⁴⁰ Freiburg School of competition has five functions: (1) to achieve allocative market efficiency, (2) to promote innovation, (3) to provide consumer choices, (4) to protect the consumers, and (5) to control the concentration of economic power, which can expand to paralyse the political power of democratic states (see e.g., Nguyen *et al.*, 2000: 248; Dabbah, 2003: 31, 90-91).

1.1.2, both competition and efficiency are only means to reach another end, namely consumer welfare. Such welfare could be ‘inefficient’ from the viewpoint of some firms, but no author has ever challenged the interests of the consumers as not worth considering. Article 81(3) EC states that an anticompetitive agreement, even if it results in a greater efficiency for society, is unacceptable if (among others) the consumers do not “receive a fair share” of such efficiency. Mr. Justice Scalia from the US Supreme Court in *Verizon v Trinko* (decision of 13 Jan. 2004) held that antitrust law does not require the incumbent to serve all consumers by the most efficient mean. Vice versa, neither should the incumbent require the consumers to sacrifice their interests for the sake of its productive efficiency.

The trouble with the above ‘consumer welfare’ argument is that consumers have different ‘benefits’ and ‘detriment’. In addition, what benefit the consumers in the short run may eventually harm them in the end. As we can see in section 1.2.1(a) and (b), a competitive market is obviously good for the consumer in the short run. However, a market controlled by a natural monopolist may be efficient because it adapts with the economies of scale and economies of scope. That is, some markets require so high investment that only a monopoly undertaking can sustain. It must also produce different kinds of products to make the best use of its investment. As the monopolist innovates, consumers will benefit. As mapped out in section 1.1.2, the issue is not whether efficiency, competition, or both are desirable. The issue is whether the social benefits of a legal intervention will outweigh the social costs. After considering costs and benefits, the solution that gives the largest total surplus shall be favoured (Becker, 1962, Viscusi *et al.*, 2001: Introduction). This is, however, easier to be said than done.

1.2.2 THE ECONOMIC ANALYSIS OF SOFTWARE COPYRIGHT

a. Software and knowledge as public goods

The principal function of copyright is to prevent free riding of public goods. Public goods, such as knowledge, are those that share two characteristics: (i) no one can lose utility by sharing the goods (non-rivalry), and (ii) it is difficult to exclude users who do not pay for the use of

public goods (non-excludability).⁴¹ Morally, sharing knowledge is a noble cause. Thomas Jefferson said that by sharing knowledge “no one possesses the less, because every other possesses the whole of it.”⁴² Confucius also once said: “stealing a book is a noble crime” (Alford, 1996). Isaac Newton once wrote in a letter to Sir Robert Hook in 1676 that a dwarf can see further than the giant by standing on his shoulder.

In economic terms however, public goods are one of ‘market failures’, and Hardin (1968) referred to it as ‘the tragedy of the commons’. If a user of public goods does not reimburse the maker of the good for the benefit that he enjoys, he is better off and the maker is worse off. Those who benefit from public goods without paying the maker are called ‘free riders’, and copyright protection is necessary to prevent free riding. According to Landes and Posner (1989: 363), “the lower the cost of copying, the greater the scope of copyright protection.”

Another justification of copyright, from Kenneth Arrow (1962), relies on the disproportion between the costs of making the first copy of a product (investment costs or fixed costs) and the cost of reproducing it (marginal cost). This argument is particularly appropriate in the software sector, where the fixed costs are high and presumably unrecoverable (‘sunk costs’) if there is no copyright protection, whereas the marginal cost is negligible.⁴³ Hence, copyright protection is necessary for the author to recover his sunk costs in research and development (R&D).⁴⁴

⁴¹ See Paul Samuelson (1954), McNutt (1999), Calandrillo (1998), Cooter and Ulen (2000: 40).

⁴² Thomas Jefferson (1813: 175) *Letter to Isaac McPherson*, in *The Writings of Thomas Jefferson* (ed. Washington, H. 1861).

⁴³ US Department of Commerce, *Digital Economy 2000*: In 1998, IT industries invested US\$ 44.8 billion in R&D, or nearly one-third of all company-funded R&D. Between 1994 and 1998, US R&D investment in IT industries increased 37%.

⁴⁴ See also Arrow (1962: 616), Quah (2002), Scotchmer (1998), Menell (1999: 133-146) and Castells (2001).

Apart from the free riding and sunk costs justification, other copyright theories have focused on transaction costs (Demsetz, 1970; Gordon, 1993; and Nettanel, 1996). Transaction costs are “the costs of establishing and maintaining property rights” or “the costs resulting from the transfer of property rights.”⁴⁵ Coase (1960: 114) provides some examples of transaction costs, including search costs, information costs and enforcement costs. Stemming from the Coase theorem (when the transaction cost is zero, property rights do not matter, see section 1.2.1.a), when transaction costs are high, property rights should be clearly defined. Menell (1999: 133) submits that copyright is necessary to lower the transaction costs of the author and help him to transfer his work. No one would pay for his work without knowing when a work is transferred and how to protect it (high negotiation costs and enforcement costs).

b. Software as durable goods

Software by nature is not only public goods but also ‘durable goods’. Katz and Shapiro (1999: 36) demonstrate that unlike an aircraft or an automobile, software will not subject to normal wear and tear. It only wears out due to technological change and ‘planned obsolescence’. Therefore, innovation is the only way software developers can sell their products. Statistics show that software upgrade was accounted for over 50 percent of the revenue in this industry (Somerville, 1995: 686-88).

However, we neither should exaggerate, nor can consider durability as the unique characteristic of the software industry. Consumers in many markets also do not wait until old products wear out before buying new products (Foster, 1986; Davies and Harrison, 2001). Moreover, with the risks of technical errors and virus intrusion, the argument that software is a durable good is diminishing. Corporate users would not run the risk of using a software program if this program is no longer supported by the software developer. The life of a software product practically ends with the withdrawal of the after-sale services for the product.

⁴⁵ The existence of these costs is proved in many studies (see e.g., Allen, 1999: 911).

c. Software is liquid

The third characteristic of software, which has so far been under-researched, is its flexibility. For example, hardware such as a car front wing in *Volvo v Veng* [1988] ECR 6211 cannot be used in any other car but Volvo. Software such as a Java-written application can be run on a variety of platforms with minimal porting (Landon and Landon, 1999: 199-201; Menkhoff, 1999: 107). Likewise, contents in Word format can be converted into PDF format and vice versa, using ‘converter’ or ‘gateway’. Most recently, web services, which are small and standardised software, can be grafted onto existing software programs to help them to communicate with each other at different levels or platforms. This new technology makes software products become even more flexible and less platform-dependent. According to Bulkeley (2003b), by 2003 about 80 percent of US companies have used Web services in the software applications internally. As ‘software is liquid’, system compatibility is easier to achieve with software than with hardware. A software product can interact with different products or different users, provided that two software products or two digital contents have compatible interfaces or data formats (see section 1.3.3).

1.3 SOFTWARE SECTOR, NETWORK EFFECTS AND COMPATIBILITY

1.3.1 NETWORK EFFECTS, PUBLIC GOODS AND DURABLE GOODS

The previous discussions based on cost-benefit analysis (section 1.2.1.b), public, durable and liquid goods (section 1.2.2) become further complicated by taking into account network effects; which may bring benefits to consumers, but at the same time may restrict their freedom of choice. According to Katz and Shapiro (1986), Viscusi *et al.* (2001: 275), Liebowitz and Margolis (1994: 135), network effects occur *when the benefit that a consumer derives from consuming the good increases with the number of other consumers of that good or compatible goods*. When network effects can affect the well being of a network user, beyond his intention, these effects generate *externalities* (Shavell, 2004: 77). An example of *positive network externalities* is the use of Acrobat’s portable data format (“PDF”) in securing a document file from being modified. The more people adopt the PDF standard, the more benefit a PDF user

receives, for he can exchange and read documents with other people easily without conversion. Such network effects can be thought as a form of economies of scale, but on the demand side rather in production (OECD, 2001: 2.2.4; and 2001a).

a. Taxonomy of network effects

There are two types of network effects for compatibility, direct and indirect network effects (see e.g., Katz and Shapiro, 1994; Gallaughan, 1997). Direct or horizontal network effects occur between two products in the same market. These effects may generate among different components of the same product. For example, a PDF file includes two components: the data and the PDF data format (Braa and Sorensen, 2000: 42). To convert a PDF file into another file (e.g., Microsoft Reader), the data format of Microsoft Reader must be compatible with the PDF format. Users of PDF format cannot use another format if they cannot convert their old files. Indirect or vertical network effects occur between two integrated products, such as Windows (an operating system) and MS Word (a word processor). Similar to an economy of scope, those who buy Windows must buy a compatible word processor, MS Word (see e.g., Farrell and Klemperer, 2002: 6). These products markets are the *upstream* and the *downstream* markets.

We can illustrate the impact of horizontal and vertical network effects in a simple mathematical formula. Suppose that a market has only two firms (Cournot duopoly) producing two substitutable products 1 and 2, generating total utilities U_1 and U_2 . We have:

$$U_1 = u_1 + n_1e, U_2 = u_2 + n_2e; \text{ then } U_2 < U_1 \text{ if } u_2 - u_1 < (n_1 - n_2)e \quad (1)$$

Where u_1 and u_2 are the initial utilities of products 1 and 2; e is the positive externality of adding one user to the network; n_1 and n_2 are the number of the users of products 1 and 2, respectively. Formula (1) above shows that if $n_1 > n_2$, the users of product 1 would not switch to product 2 even when product 2 is better than product 1 in terms of quality ($u_2 - u_1 > 0$), as long as $u_2 - u_1 < (n_1 - n_2)e$. Network externalities can 'lock-in' consumers. If the number n_1 is sufficiently large to cover almost all users in the market, n_2 will be minimised. Consequently, network effects can 'restrain' competition in such a market.

When network effects limit the consumer's freedom of choice, the incumbent could increase price or reduce quality to maximize profits without fearing that the consumers will switch to the other products, at least in the short run. In that sense, network effects can give rise to not only positive externalities but also *negative externalities* or *economic rents* (Pindyck and Rubinfeld, 2001: 294; McCarty, 2001: 46). The incumbent may exploit the rents to the detriment of the consumer. The issue is how to reduce the negative externalities of network effects without harming their positive externalities for consumers.

b. The impact of network effects on traditional economic assumptions

Brian Arthur (1996) asserts that when consumers are constrained by network effects, their demand for the networked products could accelerate greatly. Instead of a traditional economic assumption of decreasing return as production grows, the economy of network effects is characterised by an 'increasing return' of scale. Owning a network is therefore a desire of any producer. However, under the traditional economic assumption, building a network is not simple. For a network to develop, there must be a large consumer base, and the product price must be low, so that consumers are willing to buy it to establish the base. As production increase, the marginal cost of manufacturing an additional product will also increase, which leads to an increase in price (see Cooter and Ulen, 2000: 22-27; and Figure 6 above).

The assumption on increasing marginal cost was rejected by Demsetz (1970), and Cornes and Sandler (1996), with respect to public goods. As presented in section 1.2.2, the fixed cost of making of public goods may be high, but the marginal cost is negligible. Low marginal cost makes the establishment of a consumer base, and therefore network effects, more feasible. The firms that can produce the first product, can produce billions of the same products at minimal extra costs. In other words, the so-called 'economies of scale' in the patchwork economy would exist for these firms (see also Stiglitz and Driffill, 2001: 198). The business issue of the networked economy is not how high a producer can charge the consumers for his product, but how many consumers are willing to buy the product. To gain the upper hand against competitors (see Formula 1), producers are willing reduce prices or even give away his product.

An example is Adobe. It gives away Adobe Acrobat Reader in order to promote sale in Adobe Acrobat Distiller. The latter can ‘freeze’ document files into PDF format, which in turn can be read by Adobe Acrobat Reader only.

The ‘low marginal cost’ characteristic of public goods makes network expansion feasible, which in turn benefits both the producers and the consumers. For the consumers, a competition for network effects will reduce the product’s price or increase the product’s quality. For the producers, network effects help innovators to recover sunk costs and diminish the negative effects of free riding. With network effects, the producers could take the monopoly revenue from the upstream market to subsidise the R&D sunk costs in the downstream markets. On the negative side however, the race for network effects may lead a producer to apply the tactics that increase its consumer base by arguably prejudicing the consumers in the end (Larouche, 2000: 231-268). These disputable practices include cross-subsidisation, predatory pricing or bundling.

With network effects, the justification of copyright on the grounds of transaction costs reduction is also problematic. Copyright could combine with network effects and strengthen market power of the rightholder. Consumers’ negotiation costs (i.e., transaction costs) with the rightholder will increase (Page, 1999). Therefore, copyright reduces transaction costs for the rightholder, but increases transaction costs for the consumers. Since the transaction costs of different players are different and sometimes contradicting, the Coase theorem cannot apply. The justification for copyright protection based on transaction costs is therefore inappropriate.

1.3.2 SOFTWARE AND NETWORK EFFECTS

a. Interaction between software and other information layers

To consider the strength of network effects on the software sector, we will study again the Lessig’s multi-layered information structure in Figure 5 above (section 1.1.3).⁴⁶ Lessig (2001:

⁴⁶ For more discussion surrounding Lessig’s model, see Oxford Internet Institute (2003).

23-25) defines layers as part of the “communication system that together make communication possible.” Werle (2001:6); Hanseth (1996: 14); and Shneiderman (1998: 18) note that an information structure works like a human body: layers are brains, hands, eyes, ears, mouth, and legs. Information and media are received through eyes, ears, mouth or skins (content layer), then transferred to the brain (code layer). The brain processes information and commands the hands, legs, eyes and ears to react (physical layer). Similar to Lessig, Weil and Broadbent (1999: 340); Grove (1997: 42); Bresnahan (1999); and Hanseth (1996: 176) also assert, through legal, economic and computer science approaches that IT environments consist of at least three elements: physical layer, the software layer and contents or services (media or information solutions).⁴⁷ Contents or services are built upon software (the “code layer”, in Lessig’s term), and software is built upon hardware. As these models are similar to each other, the Lessig model will be used as the main reference.

In Lessig’s three information layers, one layer is built upon another, and the lower layer is the infrastructure - the essential facility of the higher layer. As such, there are vertical network effects between two vertically integrated layers, and possible horizontal network effects between the products of the same layer (see e.g., CCIA, 2003b). An example of the first type is the relationship between Intel microprocessors and Microsoft software. An example of the second type is the relationship between two software programs sharing the same data format (e.g., Adobe Acrobat Reader and Adobe Acrobat Distiller).

The code layer, software, is the buffer between the hardware and the content layer. This strategic position determines both compatibility and efficiency of information technology. If each layer is a product market, the interoperability between two layers is crucial to the functionality of the network (see e.g., *Microsoft Appeal*: 11). Fitzgerald (2001) called interoperability “the principle of digital discourses.”

⁴⁷ For IT multi-layered structure, see Grove (1997: 41). Berners-Lee (1999: 129) and Hanseth (1996) listed four layers of the Internet. These are transmission, computer, software and services.

b. The components of the software sector

According to the Organisation for Economic Cooperation and Development (OECD, 2002a: 105-15), the software sector consists of two parts: packaged software and (tailor-made) IT services. The 1999 world market for packaged software is illustrated below (by revenue).

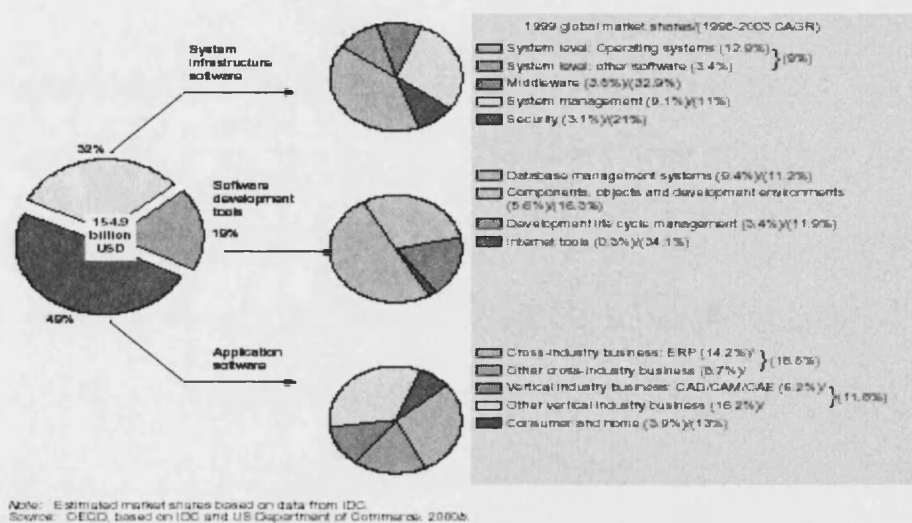


Figure 7: world market for software package 1999 (OECD, 2002a)

A software package includes system infrastructure software, development tools and application software. Application software covers half of the software sector and consists of computer programs that interact directly with the users. The largest part of this segment is enterprise resource planning software (ERP) and popular applications, such as Microsoft Office or Adobe Acrobat Reader. The next major part is the vertical industry applications, such as the computer-aided design (CAD) or computer-aided manufacturing (CAM) software. Consumer and home software, such as Play Station (entertaining software) covers the smallest part.

The second segment (infrastructure software) is composed of the programs that deal with internal operation of a computer, such as system level, middleware, system management and security. System levels are operating systems (e.g., Microsoft Windows, Solaris and Linux) and

network software (e.g., Windows NT, Apache or Unix). Middleware (such as Internet browsers or search engines) enables shared use between computing resources across heterogeneous systems. System management software (such as Oracle database management programs or IBM Tivoli Analyser) co-ordinates, controls and optimises computing environment. The last part is security software, which comprises firewall, encryption and anti-virus software (OECD, 2002a: 115-16; IDC Report, March 2003; and META Group, 2003).

The third segment (software development tools) is divided into (i) database management systems, (ii) components, objects and development environment, (iii) development life cycle management, which supports software development processes and (iv) internet tools (such as HTML). They are tools in package software or information system designs.

IT services include media and information solutions that are tailor-made to consumer demand, such as e-commerce solutions (e.g., Amazon.com or eBay.com) or information management systems.

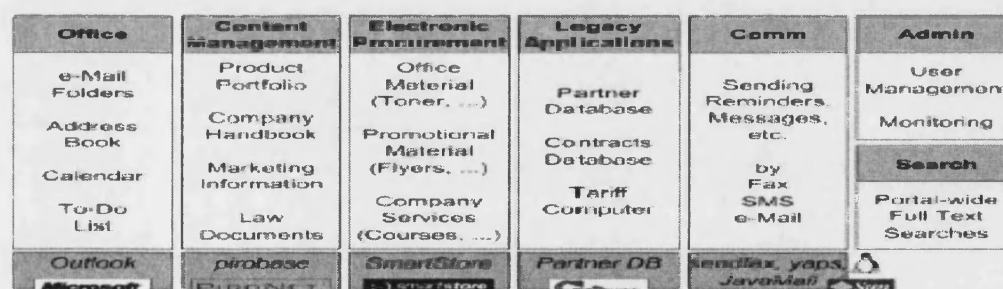


Figure 8: software packages and IT service (Gruhn and Schope, 2002)

IT services are not separate from software packages. As Gruhn and Schope (2002) show in Figure 8 below, an information system includes many different software packages: a software developer may design an information solution for a customer, or the customer may contract-out his work to an IT service consultant. OECD (2002a) records that this type of business, until

recently, has constituted the largest source of revenue for some large software companies, such as IBM or Computer Associates.

Three points can be drawn from the above observations. Firstly, there is an inter-dependent relationship between software segments: applications and infrastructures, IT services and software tools. Thus, vertical network effects for compatibility among segments exist, although the strength of this will depend on particular segments. Secondly, in each segment, products that are competing may not be entirely substitutable to each other. For example, MS Exchange and Lotus Domino are two competing e-mail applications, but the users of MS Outlook would not think Lotus Domino and MS Exchange are substitutable, unless the interfaces between these two programs are compatible. MS Exchange is only compatible with MS Outlook, and Lotus Domino is only compatible with Lotus Notes. Thirdly, many products in different software sub-layers are bound together for functional purpose.

1.3.3 INTERFACES AND DATA FORMATS

The interaction between two layers or between two products in the same layer is possible through interfaces and data formats, as can be seen as the arrows in Figure 5 (section 1.1.3). Since there is a causal relationship between control of popular interfaces/data formats and control of markets, these elements are the focus in this thesis, and deserve more analysis: how they start, develop, dominate and become infrastructural elements in a market.

a. Interfaces

An interface is an “imaginary or actual transition at the *border* between two similar units, such as functional units, structural units or program components with agreed rules for the transfer of data or signals.”⁴⁸ The compatibility between two interfaces is a matter of rule

⁴⁸ See Karjala (1988), referring to the definition of the German standard organisation (DIN) No. 44300. Pilny (1992: 199) and the US Office of Technology Assessments (OTA 1994).

(agreement), not of creativity or innovation. Interfaces exist in all information objects that require interaction, including software.

There are two types of interfaces: user interfaces and communication protocols. A user interface is a mean through which the computer and the user communicate, such as the configuration of peripheral devices, such as the keyboard, screen display, printer, scanner, or fax modem. Communication protocols or routines are the *rules* that allow two parts of a computer or two computers to interact with each other.⁴⁹ A special form of interface between a digital media player and digital contents is ‘codec’ (coder/decoder), being a piece of player’s code that compress/decompress algorithm (*Microsoft Europe Decision*, para. 61).

The interfaces between operating systems and application programs are called the application-programming interfaces (APIs). Every operating system has APIs. The more applications written for an operating system, the more important the roles of the APIs. A good example of these interfaces is the APIs of the Windows operating system, which support over 70,000 applications, whereas Windows’ rivals, OS/2 has only 2,500 applications (*US v Microsoft, Finding of Facts*: paras. 40 and 46).

b. Data formats

Technically, data format or data structures are also interfaces. However, they deserve more attention. According to WordNet (1997), data format is an organisation of information compiled based upon a pre-set specification, which determines the format (tracking and storage) and the transmission of data. Examples are the PDF data formats in the example in section 1.3.1 above, the numbering of books in a library following the US Library of Congress’s Index, or the binary codes in a word processing program. A special form of data format for audio and video

⁴⁹ *Id.* Communication protocols include three parts: (i) control information, which controls the data sent via the communication link before the transfer of user data, (ii) data format that localises both control and the communication of data, and (iii) data sequence that determines the sequence of communication (Karjala, *id.*). See also the *Microsoft Europe Decision*, Art. 1(2). For more details on interface design, see Shneiderman (1998).

content streaming from the Internet is called 'streaming protocols'. Another type of format that protects the content from being copied is called digital rights management (DRM) specifications (*Microsoft Europe Decision*, paras. 64-65).

1.4 SOFTWARE AND THE MICRO INFRASTRUCTURAL ELEMENTS

1.4.1 CRITICAL MASS AND NETWORK EFFECTS

To study the relationship between interfaces, data formats and network effects, many authors have focused on the origin of network effects, entitled the critical mass (see Figure 9 below). This is a certain level of market share, when the consumer demand for a product or an element accelerates to become self-sustaining.⁵⁰ For example, Mahler and Rogers (1999) present a survey among German banks on the standard adoption of electronic banking, and conclude that a standardised interface reaches a critical mass when its share is from 20 to 30 percent of the market. Authors who have studied critical mass have believed that by observing the technology trend, the law could intervene at the right moment to prevent abuse.

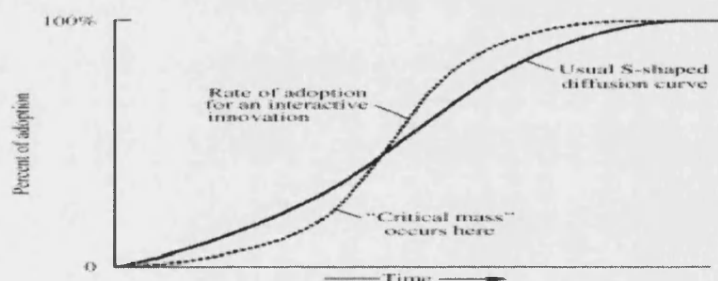


Figure 9: critical mass and standard diffusion

Nevertheless, using critical mass or market share to find the border between legitimate and illegitimate conduct is not an appropriate approach. Firstly, a critical mass is not the point of no return. For example, it took seven years for WordPerfect to dominate the word processing

⁵⁰ Mahler and Rogers (1999: 721), Brown (in McKnight *et al.* 2001: 81), Creuss and Agustinoy (2000: 63). Allen (1988: 263) also called critical mass as Schelling point (focal point).

market, but the dominance lasted only for six years (see OECD, 2002a: Table 3.15). Secondly, the issue is not when a standard adoption reaches a critical mass, but why this critical mass is reached. Critical mass is only a symptom, which can be explained by many reasons, such as superior efficiency, compatibility requirements, positive feedback, or crowding-in. These reasons could be legitimate or illegitimate, depending on the context. Only the reach of critical mass by illegitimate means is a legal concern. The consumers may support a product not because it has passed the critical mass, but because such a product is tied or bundled with another product, which has reached the critical mass. The element that ties different products together will be referred to below as the ‘micro infrastructural element’.

1.4.2 THE MICRO INFRASTRUCTURAL ELEMENTS

According to the Webster’s New World Dictionary of American Language (1970), an infrastructure is a substructure or underlying foundation, common platform or backbone. This broad concept highlights the role of one product from another or one part of a product from another part of it. For example, in the multi-layered information structure in Figure 5 above, the lower layer is the ‘macro’ infrastructure for the higher one. *Microsoft Europe Decision*, para. 66 notes:

“Encoding software, streaming servers and media players that are compatible in terms of codec, format and streaming protocol support can be used to build a software infrastructure for delivery and consumption of [digital content]. Such an infrastructure will also constitute a platform for the development of further applications, which will use the services provides by it. In particular, media players may exhibit APIs upon which other applications will call.”

Another important element is the ‘*micro*’ *infrastructural elements*, which are the common interfaces and data formats for different products, such as Windows APIs, Windows media audio [WMA] and video [WMV] data formats.⁵¹ Other examples of MIEs can be the PDF data

⁵¹ Fischer and Rubinfeld (2001: 20) demonstrate that the reason behind Microsoft’s practice to foreclose Netscape is control of Windows APIs. To the extent that the browsers expose the APIs, they support applications independent of the operating system.

format of the Adobe Acrobat Reader program, data formats of infrastructural applications, such as .doc (Word documents) and .xls (Excel spreadsheets), the MPEG (Moving Picture Experts Group) interfaces for multimedia software or the DVD data format for picture storage and transmission. Like software programs, software MIEs can also be protected by copyright.⁵²

We can refer to the Wittgenstein's theory of natural language (reprint 1961: 212, quoted by Hanseth, 1996: 29-33) to explain the importance of MIEs. According to Wittgenstein's theory, to combine words and make comprehensible phrases, users must follow certain rules. These rules are the infrastructures of communication, which exist at different levels: the micro level (the alphabets or words in a dictionary) and the macro level (the grammar of a sentence). As such, an MIE could be any elements that fulfil two conditions: (1) it is used as a common platform or cross-platform between different software products, and (2) it is essential for these products' functionality. In the terminology of competition law, the MIE is an essential facility (in French *l'infrastructure essentielle*, see the opinion dated 2 October 2003 of AG Tizzano in *IMS Health v NDC C-418/01*, at para. 35). This utility is an indispensable input in a product market, where the entrants do not have an alternative source of supply.

1.4.3 SOCIAL NORM: "PRIVATE SECTOR SHOULD LEAD"

Given the importance of MIEs, the next question is whether the state or private firms should develop the MIEs. As Werle (2001: 15) and Allen (1988: 263) observe, the success of privately built standards (Java and MPEG) and the failure of publicly sponsored ones (OSI and Minitel) show that the private sector may be in a better position than the government to develop standards. Hanseth (2000a: 57) also demonstrates that developing a standard bottom-up rather than top-down is more technically desirable. If a standard wants to become an MIE, it is supposed to be relatively stable, so that other objects can be developed (*inertia*). At the same

⁵² See e.g., *Powerflex v Data Access* [1988] FFC VG 295 in the software context and *IMS* in section 1.5.3 below in the database context. Please note that under US copyright law, an interface may not be copyrightable if it becomes *scene a faire*, such as the graphic user interface (GUI) in *Apple v Microsoft* (1992) 35 F.3d 1435. Decisions are varied from jurisdiction to jurisdiction. See also Shneiderman (1998: 115 - 118) on this topic. The copyrightability of the MIEs will be elaborated in section 2.2 below.

time, according to Hanseth (1996: 8 and 98), Mansell and Steinmueller (2000: 129), the standard should be relatively flexible to be adaptable with technological changes or new business strategies (*impetus*). Since software is liquid, MIEs need flexibility, they are better guided by consumers' positive feedback and private choice than decisions of governments.

Clinton and Gore (1994) demonstrate that in many cases, private firms have been more resourceful, acquired more information and have been better motivated to develop infrastructures than the government.⁵³ They also note that as the overall costs and benefits calculation have favoured private sectors, and the role of government in policing the information infrastructures takes priority over direct investment in them. Statistics from OECD (2000a) show that with adequate incentives, private firms could do a good job in developing an infrastructure and benefiting consumers.⁵⁴ The roles of private standards are undeniable.

1.4.4 SOCIAL NORM: "WRITE ONCE, RUN ANYWHERE VERSUS SPEND ONCE, USE ANYWHERE"

a. *Virtuous circle of standardisation: write once, run anywhere*

Where does the formation of infrastructure start? The answer can be found in the demands of infrastructural elements. Hanseth (2000: 56-57) and Werle (2001: 8) demonstrate that software developers share a common interest in developing compatible standards, following the

⁵³ See OECD (2002a: Section III). In the 1990s, private companies have invested more than US\$50 billion annually in information infrastructure, as opposed to the US government budget of US\$1-2 billion.

⁵⁴ In 1994 and 1997, the US government launched a "national information infrastructure" (NII) and the global information infrastructure (GII). The two key terms of NII and GII are: (1) the private sector should lead, and (2) regulations should support a predictable, minimalist, consistent and simple legal environment for commerce. Corresponding with the US approach in the NII, the European approach was reflected in its policy in developing an Information Society (IS). See OJ C 376, 12.12.1996, Report of DGXV Commissioner Bangemann: *Europe and the Information Society*. Japan, Korean and Singapore have also launched their "NIIs" (Dedrick and Kraemer, 1998).

‘battle of the sexes’ game.⁵⁵ Later on, software standard becomes popular by gradually building up its support base (incremental innovation) rather than by shock therapy (revolutionary innovation). When the number of consumers reaches critical mass, adoption becomes self-sustaining and accelerates (spillover effects). Werle (2001: 32), Barak (1997), Katz and Shapiro (1986), Grindley (1995) and Hogan (2001: 14) called the above process a ‘virtuous circle’. The circle starts with an initial adoption of the first consumers. As more consumers use the same standard, they express positive feedback, which leads to further adoption, establishing a consumer base and a network of products surrounding it vertically and horizontally, similar to the example of the Windows APIs in section 1.3.3.a above. Hanseth (1996: 127) explained this process as follows:

“Building large infrastructure takes time. All elements are connected. A whole infrastructure cannot be changed instantly: the new has to be connected to the old. Hence, the old - the installed base - influences how the new is designed.”⁵⁶

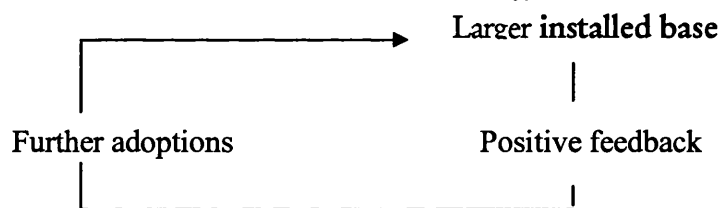


Figure 10: virtuous circle of standardization

The philosophy of Hanseth, or indeed of most computer scientists, is to optimise the incremental process of software infrastructure development. The idea is to produce a maximum output from a minimum input. Thereafter, they have developed standardised software that can be used in many platforms, thanks to the liquidity of software (section 1.2.2.c). Software

⁵⁵ Baird *et al* (1994): 42. The “*battle of the sexes*” game is a two-by-two game about a conflict between a couple who want to spend an evening together but had different preferences. Since they prefer going together than going alone, they would be eager to yield (co-operate) rather than confront. In this game co-operation is always the best outcome.

⁵⁶ Hanseth’s theory of incremental infrastructure also coincides with the structural social norm development of Giddens (1999 and 2002). Ellickson (1991: 157) also noted that people has a demand in developing common platform or common culture, through ‘trial and error’ experimentation.

engineering language, such as Java was also developed following this philosophy – write once, run anywhere (Hatch, 1999).

b. Convergence: spend once, use anywhere

The standardisation process from the supply side has made it possible for one product to be added with more features to serve more functions. This process is named ‘convergence’.⁵⁷ It stimulates a new consumer demand for ‘spend once, use anywhere’ products, similar to the demand for ‘write once, run anywhere’ standards of software developers. For example, the standardisation process in a desktop operating system or a web browser allows different application programs to develop. Thanks to the liquidity of software, a PC no longer performs only computation or word processing. It becomes an image editor, a telephone, a television-on-demand or a music player. Likewise, a mobile handset can now fulfil many functions: a television, a digital camera or a personal digital assistant (PDA). In addition, consumers after purchasing a product in the code layer will spend time and money to the physical layer (the computers) and the content layers (the files or databases, see Figure 5 in section 1.1.3). As rational and self-interested people, consumers want their expenditure to support as many utilities as possible, not to ‘sink’ when one utility is replaced with another.

What we can conclude from above is that on the one hand, software developers aim to expand their standards and lock the consumers into their product. On the other hand, consumers want their expenditure to be reusable in as many products as possible. How to balance these contradictory objectives and accommodate technology development with people’s demand is the question of both software design and software governance.

⁵⁷

According to the Commission (1997), convergence is “a process in which different network platforms carry similar kinds of services and the consequent coming together of consumer devices such as telephone, television and PCs.” For convergence, see Bing (1995) on three convergence movements: terminals, markets and services. For further studies of convergence concept, see Marsden and Verhulst (1999).

1.4.5 THE ROLE OF POSITIVE FEEDBACK IN DEVELOPING NETWORKS

Section 1.4.4 above has also highlighted the importance of consumer positive feedback and technology diffusion. Paul David (2000: 58), Rubinfeld (2001) and the statistics from OECD (2002a) assert that in the first period of standard adoption, consumer demand depends on positive feedback rather than network effects. Bill Gates also testified before the US District Court that the secret of its success was ‘positive feedback’ (cited in *Microsoft Europe Decision*, para. 451). Quality, which stimulates positive feedback, makes the product popular, not network effects.

However, the time gap between obtaining initial positive feedback and dominating a market can be short or long depending on indirect network effects. The survey of Evans, Nichols and Redly (1999, cited by OECD, 2002a) showed that it took DBASE less than one year to become the market leader in database software and this position has been maintained for 12 years. On the contrary, it took Paradox eight years to become the market leader in database tool, but MS Access surpassed it in only one year. It is not to say that consumers preferred using DBASE to Paradox, but at the time of Paradox technology diffusion was high and the network effects supporting MS Access were strong. MS Access could quickly diffuse because it was bundled into Microsoft Office package, the most popular application toolkit. Many consumers have installed Access ‘by default’ to their computers although they have never used it. When they need a database program, they would think: “why should I install Paradox when I already have Access?” The same example could apply to Netscape (which was surpassed by Internet Explorer) or RealOne (which was surpassed by Windows Media Player, see also Bayoumi and Haacker, 2002: 22, 29).

Hence, there are shortcomings in the argument of positive feedback. Firstly, similar to critical mass (see section 1.4.1), positive feedback only indicates the symptom of consumer’s attachment to a product, it does not explain why consumers become so attached. A product may gain positive feedback because of competition on the merits or because of anticompetitive conduct such as exclusive bundling. In the above Paradox-Access example, the result could have been different had Paradox and Access been equally bundled/ unbundled to the MS Office

and competition on the merits can take place. Secondly, there is a relationship between positive feedback and network effects. Positive feedback stimulates network effects. Network effects when they are strong also help stimulating positive feedback (see e.g., Fischer and Rubinfeld, 2001: 10). In the second case, positive feedback does not reflect a real consumer demand.

Nevertheless, we do not mean that positive feedback originated from network effects is always inefficient, or taking advantage of it should be prohibited, due to the following reasons:

- 1) R&D costs in software engineering can be high; therefore, the same technology should be reused as much as possible. Without exploiting network effects and monopoly rents, standard innovation may not be possible at all (Alborn *et al.*, 2000; Sommerville, 1995).
- 2) Network effects are similar to natural resources, which should be exploited, if not by the incumbent, then by the entrant. As Schmalensee (2000: 194), Ulrich (2000: 291) and Posner (2001: 251) emphasise, users also desire standardised products, thanks to which they can communicate to each other.
- 3) From a technical standpoint, Hanseth (1996) demonstrates that firms must follow strategies that are the most effective in terms of time and money. They must reuse the old standards while building the new one and at the same time obtain positive feedback from the consumers. This process eventually favours standardisation and network effects. Hence, there is a genuine interest in exploiting network effects, from the perspectives of both the suppliers and the consumers.

To conclude, one cannot assume that a standardisation process is efficient if a product wins positive feedback. If positive feedback reflects competition on the merits, it is an indication of allocative efficiency. Otherwise, as shown in the MS Access example, it is an indication of MIE control tactic that may prejudice consumers. Examples of the harmful effects of MIE controls are presented below.

1.5 REFUSAL TO MIE LICENSE AND ITS EFFECTS ON CONSUMERS

1.5.1 MARKET POWER IN THE SOFTWARE SECTOR

In most jurisdictions, the starting point of analysing how a refusal to license an MIE can abuse its dominant position is to assess market power of the MIE owner (see e.g., OECD, 1999a: 180). At para. 391 of *US v E.I. du Pont de Nemours* [1956] 351 US 1, the US Supreme Court defined market power as the “power to control price or exclude competition.” In *United Brand* [1978] ECR 207, the ECJ also defines market power as “power to behave to an appreciable extent independently of its competitors, customers and ultimately of its consumers.” To analyse market power, one needs to take into consideration a combination of several factors, including market definition, market share and ability to control bargains (Goyder, 2003: 324). Amongst them, market definition is the most important factor. It will define whether, in a particular environment, a consumer’s purchasing power, which stimulate competition on the merits, is restricted by a dominant firm (see, e.g., *Market Notice*, para. 2).

a. Market definition

A market is an environment where competition incurs among products that are “reasonably interchangeable by the consumers for the same purposes” (*du Pont*, 351 US at 395, *Market Notice*, para. 2; *GVR*, para. 91). A market comprises of two factors: product market and geographical market.⁵⁸ Each factor is subject to constraints, namely demand and supply substitutability, and potential competition (see e.g., *Market Notice*, para. 13). Moreover, *Market Guidelines* emphasise: “market definition is not a mechanical or abstract process but an analysis of any available evidence of past market behaviour and an overall understanding of the mechanics of a given sector” (para. 35).

⁵⁸ For example, the product market for Continental Can’s products in *Continental Can v Commission* [1973] ECR 215 are cans used for meat and fish products and for metal closures other than crown corks. Its geographical market is the whole EU, where metal closures were found to be sold at similar price in Germany (see Korah, 1992: 72-73).

Geographical market is “the area in which ... the conditions of competition are *sufficiently homogeneous* and which can be distinguished from neighbouring areas” (*Market Notice*, para. 8). There could be many geography-bound constraints, such as the diversion of orders, basic demand characteristics, views of consumers, barriers to exit and switching costs associated with the orders (see *Market Notice*, paras. 44-52; Anderman, 1998: 165-67). However, many of these factors, notably switching costs, have not been paid sufficient attention (see section 3.3).⁵⁹ With respect to a networked market, the geographical scope of a relevant market is determined mainly by reference to two criteria: the area covered by the network and the existence of legal and other regulatory instruments (*Market Guidelines*, para. 59). On these grounds, a geographic market can be local, national, regional or international market.

The key term for the product market definition is *substitutability*, which is:

“A measure of the extent to which products may be seen as interchangeable *from the viewpoint of producers or consumers* ... by their nature, use, price or intended use” and other “conditions of competition and/or the structure of supply and demand of the market in question” (*Market Notice*, para. 7; *Market Guidelines*, para. 44).

As such, the ‘substitutability’ test under EC law consists of two branches: ‘demand substitutability’ and ‘supply substitutability’; whereas the same test in US antitrust law consists of only demand substitutability (see *du Pont*, above). The difference is not material; as the supply-side substitution test concerns market share and barriers to entry more than the product market as such (*Tetra Pak II*, para. 110; *Market Guidelines*, para. 52).

With respect to the demand-site substitution, a traditional test is the ‘hypothetical monopolist test,’ otherwise referred to as the SSNIP test - ‘small but significant non-transitory

⁵⁹ Please note that in *Market Notice*, switching costs are considered as a factor to determine the geographical market. In *Market Guidelines* they are considered as a factor to determine the product market (para. 50).

increase in price' (*Market Notice*: 15-19, 40 and *IP Guidelines*: 9).⁶⁰ However, SSNIP is rarely used in practice due to two problems: it may suffer a 'Cellophane Fallacy,'⁶¹ and it may lack data to be conducted properly. What is more, SSNIP or any test that focuses merely on individual products and prices might not be adequate to define relevant markets for the software markets where network effects are strong and products are connected by interfaces or 'associative links' (see *Tetra Pak II*, para. 112). In the patchwork economy, the substitute products are those that have interchangeable functions (see e.g., *Market Notice*: para. 28; *Media Market, Legal*: 28, 219-20). Such an assessment may be incorrect where network effects present.⁶² With respect to an MIE-related product, a new product is substitutable with the old product in the same way as a new spare part of an automobile is substitutable with the old part.⁶³ They are not only interchangeable in terms of nature, price and intended use, but also *compatible* to the vertical integrated products (see e.g., Larouche, 2000: 134, 205).

Schmalensee (2000: 193) argues that under dynamic competition, the concept of product market has become redundant. Firstly, the whole point of market definition is to define market share, whose role has been diminishing when the economy is dynamic. Secondly, to define a relevant market, we need to define the relevant product, whereas tie-in and bundling becomes a

⁶⁰ Whish (2001: 27) explains this test as follows: "assume the incumbent raises price for its widget by 5-10 percent over a long period (minimum one year), the budgets to which the consumers may switch will be treated as substitutable products, and depending on the percentage of the consumers who switch, one could conclude whether the incumbent holds market power."

⁶¹ That is, the widget's price has been set high at the beginning so that if the monopolist raises the price, the consumers may stop buying that widget and switch. The range of 'substitutability products' in this case is large and may not reflect the true consumer substitutability (*Market Notice*, para. 19). The term 'Cellophane Fallacy' is referred to by the US Supreme Court in *du Pont de Nemour* [1956] 351 US 377.

⁶² For example, the product market for word processors running on Windows operating system is the word processors that have access to Windows APIs. To give further examples, in *European Night Service*, T-384-388/94, the product market is the market for railway companies that need access to the tracks going through the English Channel.

⁶³ The question of 'substitutability' should be taken to a reasonable extent, otherwise even the concept of monopoly does not even exist. Stigler (1968a: 320) notes that one may use aluminium or steel or wood to build a chair, hence it is difficult to rule that a firm holds a monopoly power in the furniture market.

normal practice in the network economy. However, Schmalensee's arguments do not reflect the whole picture of a market, regardless of whether the economy is 'new' or 'old'.

First of all, as explained below, market share is not the only indication of market power. Barriers to entry/exit, particularly the MIE control, are also important factors to define market power. What is more, bundling or tie-in does not change the multi-layered information infrastructure and the MIE control in deciding whether two products are substitutable. With respect to consumer demand, bundling and tie-in do not enlarge the scope of a product market. They rather narrow it. As discussed below, the scope of a product market will depend on the scope of consumers having a similar demand. Those who have the demand for basic products must be more numerous than those who have demand for bundled products, and the two criteria of consumers would still overlap. The fact that a product has been bundled into another product does not make the first or the second becomes less substitutable to third parties' products than they used to be when they are stand-alone products. As the CFI in *Tetra Pak II* points out, as long as independent manufacturers of associated products exist, the incumbent has no right to treat the main product and the associative product as an integrated package (CFI judgement, para. 138; Anderman, 1998: 193; Goyder, 2003: 299).

b. Market power by MIE control

In most cases, the identification of the relevant market, the role of the MIE and the control of the MIE can sufficiently indicate market power, without considering market share. According to para. 81 of the *Market Guidelines*, "an undertaking which is possession of an 'essential facility' [i.e., the MIE in our context] is by definition in a dominant position on any

market for that facility.” This is because the bottleneck itself constitutes a barrier to entry that prevents new firms to enter.⁶⁴

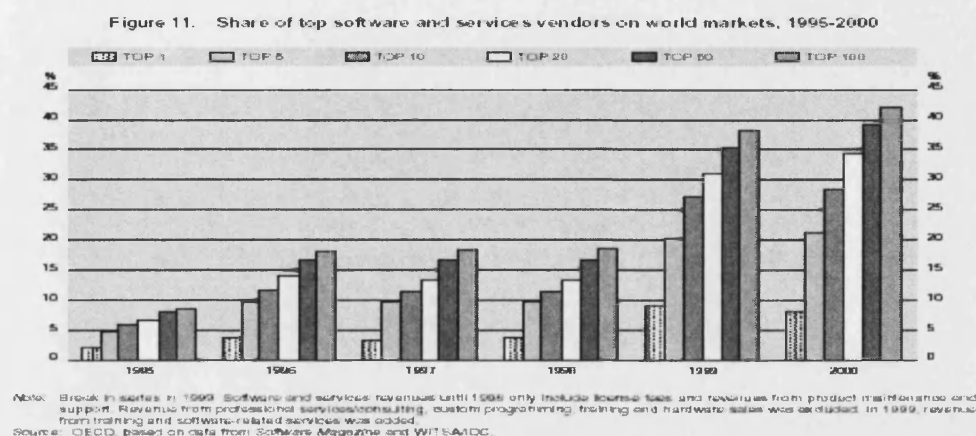


Figure 11: market concentration in the software sector (OECD, 2002a)

The concentration of power in the bottleneck-controlled firms is observable not only in the markets for packaged software but throughout all segments of the software sector. In total, as shown in Figure 11 above (from OECD, 2002a; see also Schmalensee, 2000: 193 and *NY Times* 13 October 2003), software and services revenues have been concentrated to the five largest firms, which came mainly from bottleneck-controlled software, such as Microsoft's Office or IBM's Tivoli. The market share of the top ten firms were about 20 times larger than the market share of the next ten firms (28.5 percent versus 1.5 percent). Katz and Shapiro (1999: 44) observe that the strong concentration shows that there are significant barriers to entry rather than strong competition on the merits. They asked: "if entry were easy, [profit margin is high] and installed bases are so insignificant, it is unlikely to see such large capitalization."

⁶⁴ Larouche (2000: 206) formulates that in a bottlenecked market, market share is not an important factor in determining market power. This assessment is not entirely accurate. The bottleneck has redefined the market where the incumbent can control the competition (see section 1.5.1), as the aseptic milk package is a re-defined product market in *Tetra Pak II* because the consumers in that market has been locked in. Ulrich (2000: 292), and Whish (2001: 174-75) also argue that if the operability of a market is dependent on a bottleneck, control of such a bottleneck naturally represents market power of the bottleneck's owner.

Having said that, market share is one of the relevant issues in determining market power if the MIE owner does not control the whole market but only part of it, or if the MIE owner provides MIE access to his competitors (*Market Guidelines*, paras. 67 and 78). In terms of market share, ‘dominant position’ in the EU requires a lower threshold than ‘monopolisation’ in the US.⁶⁵ Nevertheless, an undertaking would be deemed to hold monopoly power if it has a market share of 70 percent regardless of the jurisdiction the case is subjected to (OECD, 1999a: 172). Undertakings such as Microsoft (95 percent of the operating system market) certainly hold such power.

The last question concerning market power is whether the MIE control can sustain for a long time and therefore raise antitrust concern.⁶⁶ The answer is: it depends on the market’s characteristics. As far as emerging markets are concerned, over-regulation of MIE access may “unduly influence the competitive condition taking shape” within the market (*Market Guidelines*: para. 32). When the market is not dynamic or when an installed base has been established, the fact that an MIE will become obsolete tomorrow by a potential competitor does not make the incumbent’s abusive conduct today irrelevant – especially regarding pricing conduct. In addition, George Stigler, a Chicago economist, also warned a dilemma in dealing with the ‘potential competition’ argument. For potential entrants to become more than potential, the market must be attractive by monopoly profits. However, monopoly profits are needed for the incumbent, too, as he needs to be motivated. In the end, the market cannot be de-monopolised because we are in effect using monopoly profits as our main measure of the potential competition (why de-monopolise while monopoly profits is needed anyway to stir innovation?). Stigler (1968a: 329) emphases: “unless this measure is replaced, potential

⁶⁵ See Whish (2001: 42-43). The Commission has provided a ‘rule of thumb’ that any firm having a market share of more than 30 percent may be deemed to have a market power, see Art. 3 of *the Regulation No. 2790/99*. If a firm holds a market share of more than 40 percent, it may be held having dominant position (*Virgin/British Airways* OJ [2000] L 30/1). The threshold in the US ranges from 35 percent in *Penn. Dental Assn. v Medical Serv. Assn.* 745 F.2d 248 to 90 percent in *Standard Oil Co. v US* 221 US 1.

⁶⁶ *Market Guidelines* remind that competition authorities should conduct a “forward looking, structural evaluation of the relevant market, based on existing market conditions” (para. 20). Technological development may turn an MIE yesterday into a non-essential element tomorrow (see OECD, 2001: 2.2.4, citing a research of Farrell and Saloner).

competition has *no explanatory value* in dealing with monopoly price or monopoly profit.” Had we accepted the argument that “in the long run, we are all dead,” we would have given a blank cheque to dominant firms to abuse their dominant position in any way they want.

1.5.2 LEVERAGE OF MARKET POWER VS. COMPETITION ON THE MERITS

In section 1.4.4, we noted that positive feedback in favour of MS Access is due to Microsoft’s bundling tactic. This tactic is part of a strategy called leveraging. It occurs when a dominant firm uses its power in one market to restrain competition in another market (*White & White v American Hospital, Corp.* (1983) 723 F.2d. 495). Under US antitrust law, this conduct alone is prohibited, without showing that it has given rise to the monopolisation in the leveraged market (Raybould and Firth, 1991: 120; OECD, 1999: 170, and 1999a: 178). In *Otter Tail* 410 US 366: 377, the Supreme Court held that: “Sherman Act assumes that an enterprise will protect itself against loss by operating with superior service, lower cost, and improved efficiency. [Leveraging] collides with the Act as it seeks to substitute for competition anticompetitive uses of its dominant economic power.”

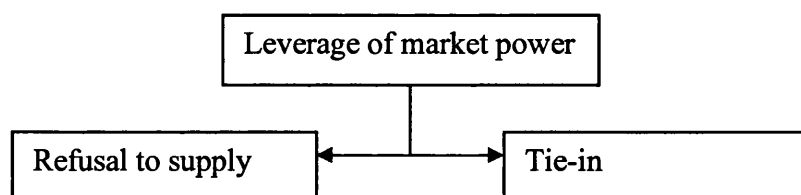


Figure 12: leverage of market power and its derivatives

EC competition law does not have a leveraging theory as such, but instead it has two similar concepts: refusal to supply (*Commercial Solvents* [1974] ECR 223) and tying arrangement (*Tetra Pak II* [1996] ECR I-5951). Both prohibit exerting market power from one market to another ‘associated market’, either through an essential facility (in cases of refusal to supply), or an ‘associative links’ (in cases of tie-in). In both cases, the dominant firm uses its power in the tying (upstream) market to foreclose competitors in the tied (downstream) market. In cases of refusal to supply, the demand of the downstream consumers for rival’s products is not met. In

cases of tie-in, such a demand is met, but exclusively by the tied-product. Both cases are two sides of the same coin: consumers will not have a freedom to choose the product they want.

In economic terminology, leveraging is a '*rent seeking*' conduct, as opposed to competition on the merits (see section 1.1.3.b). As Stigler (1982: 150) defines it, this is a situation when firms seek power not from allocative efficiency but from unproductive sources. Kolasky (2002) criticises this understanding, as it sanctions the dominant firm even if the latter does not gain monopoly power in the associated market. He argues that rent seeking is not necessarily a bad behaviour, because it enhances productive efficiency of the dominant firm. From the outset, Kolasky's comment can be rejected by two reasons. First of all, leveraging is always allowed if the dominant firm can justify his action (see *Tetra Pak II*, ECJ, para. 28). Secondly, if we accept Kolasky's argument, then almost all anticompetitive conduct would be exempted from competition law without justification. This is because all conduct must enhance productive efficiency for the dominant firm in one way or another; otherwise, they would not be carried out. Nevertheless, Kolasky's comment has a reasonable point. If a firm is not dominant in the associated market, consumers in that market can have a choice between different products (Posner, 2001: 194-95). Otherwise, leveraging conduct can only negatively affect those who bought the product in the upstream market (the 'oldsters'), not the 'free' consumers in the downstream market (the 'youngsters'). If leveraging can affect both the oldsters and the youngsters in the relevant market, at that point should competition law be concerned (Rubinfeld, 2001: 559). That being the case, a dominant firm in the upstream market will certainly hold market power in the downstream market. The examples of leveraging of market power to the MIEs and their impacts on both oldsters and youngsters are discussed below.

1.5.3 LEVERAGE OF MIE POWER AND CONSUMER WELFARE

a. MIE exploitation and the oldsters

The simplest method to extract rents from market power in the MIE is by refusal to supply the MIE that links the upstream with the downstream market. In *Commercial Solvents v Commission* [1974] ECR 223, the incumbent has refused to supply an essential material to an

entrant, who control the downstream market. Likewise, in *Telemarketing v CTL* [1985] ECR 3261, the incumbent has used its power in the broadcasting service market to foreclose the downstream telemarketing market. In *Sealink/B&I v Commission* [1992] 5 CMLR 255, the incumbent used his market power in port access to control the port facilities market. In most cases, consumers suffer direct detriment, as they either are unable to buy a critical product (*Commercial Solvents*), or must buy a product at a supra-competitive price (*Sealink/B&I*).

When excessive prices are absent, consumer detriment is more difficult to estimate, but the threat of refusal to license from the incumbent is still credible to its customers. In *US v Microsoft* [1999] 165 F.3d 952, Microsoft had used its monopoly power in the market for operating systems (OSs) to coerce the original equipment manufacturers (OEMs, such as Compaq, Apple and IBM), which are the ‘associative links’ between the OS market and the market for Internet browsers. Microsoft had warned that it would refuse to license the OEMs Windows if they installed Netscape browser instead of Internet Explorer (IE). As almost all PCs need to be installed with Windows, the threat of the Microsoft was credible. Netscape has been withdrawn from the browser market (see e.g., Clark and Edwards, 1999: 182; Fischer and Rubinfeld, 2001: 54-57). Similarly, knowing that Intel intended to enter the software market and support Sun on Java technology, Microsoft threatened Intel that Microsoft would refuse to support Intel technologies bundled with Windows if Intel did not stop software researching or aiding Sun (*Finding of Facts*: 104, 122, 127, 404; see also Rohm, 1998; Brinkley and Lohr, 2001).⁶⁷ Microsoft argues that consumers do not offer any harm, as it is still one of the most innovative firms. However, the issue is that as long as Microsoft controls the OEMs, the consumers cannot possibly support a better product if there is one.

The second method of MIE exploitation is forced upgrade. If the users refuse to upgrade because the old version is ‘good enough’, the MIE owner can modify some interfaces in the new version, consequently the old product’s utility will decrease. An example of this is the

⁶⁷ Another tactic having an effect equivalent to refusal to license is delay. In *IBM v Commission* [1981] ECR 2639, IBM has refused to license the interfaces of its computer systems until it had actually marketed its products. This conduct placed the manufacturers of equipment that would have been compatible with IBM hardware at a disadvantage (see e.g., Goyder, 2003: 302).

upgrade of operating systems from Windows 95 to Windows XP. Microsoft has refused to the release critical application program interfaces (APIs) of Windows 95 to Internet broadband providers, or software developers for picture image storage or external compact disk drivers. Consequently, the latter could not sell their products to Windows 95 users. In addition, when these users subscribe broadband services, they must upgrade their operating system to Windows XP. Consequently, they must replace MS Office 97 and other software programs that run on Windows 95 with those running on Windows XP. All these changes incur substantial costs, which could be avoided if Microsoft could grant APIs access to broadband providers or other application software developers.⁶⁸

b. MIE exploitation and the youngsters

While many cases show that MIE exploitation may harm oldsters, it is more difficult to prove that such conduct affects youngsters. A credible threat of the incumbent to oldsters may not be credible to the youngsters, who have not incurred investments in the incumbent's standard. Farrell and Klemperer (2001: 2.4.2 and 2.6) argue that the youngsters could be harmed by (1) becoming the oldsters through a 'bargain and rip-off' practice,⁶⁹ (2) limiting the oldsters' choice in the same product market, or (3) limiting their choice in related markets. Among them, the 'bargain and rip-off' concern should be set aside. Consumers must be forward looking and think of the product's spare parts, services and other expenditure before

⁶⁸ In *Caldera v Microsoft* (2000) 72 F. Supp.2d 1295, Caldera, the owner of DR-DOS, a rival product of MS-DOS, has complained that Microsoft has used system incompatibility and tying technology to prejudice DR-DOS. As a consequence of terminating the Microsoft's applications that used to support DR-DOS, the latter's users has no option but to switch from DR-DOS to Windows 95. The case has been settled in 2000.

⁶⁹ In the "bargain" period, downstream entry might be easy, especially for small companies, if they do not pose threat to the incumbent. In the "rip-off" period, the incumbent may increase price or foreclose competition. See *Dell Computer Corp.* [1995] 121 FTC 616, ECLR [1996] No. 8: R-203) and *Wang v Mitsubishi* [1993] 29 USPQ 2d (BNA) 1481.

buying a product.⁷⁰ They are the ones to be blamed if they could have made a wise choice but they had not (*volenti non fit injuria*).

We now consider the practice that affects youngsters by limitation of their choice in the same product market. A good example is *IMS Health*.⁷¹ IMS Health (the incumbent) is a pharmaceutical database company. It held copyright in a MIE, in this case a specific data format that has since become a standard in the industry. Competitors of IMS, namely NDC and AnZyx, asked for the license of the format but were refused. When they used a slightly modified format, IMS sued for copyright infringement and won the case. Three questions now emerge: (1) whether it is difficult to invent a data format similar to the format of IMS, (2) why the competitors must gain access to these formats, and (3) why they did not develop a new data format and attract youngsters. The *IMS Decision* (No. 2001/165/EC) asserts that:

- (1) It is not difficult to invent a new data format. IMS format is only a method to allocate pharmaceutical sales data according to the customers' postcodes. However, it is difficult to persuade the consumers to adopt a rival format, because they have incurred investments in IMS database by collecting their own data under the IMS format (at para. 74-166).
- (2) NDC needed access to IMS's format because the method of formatting data according to the customers' postcodes has become a *de facto* standard of the pharmaceutical companies in Germany, for historical reasons rather than those of efficiency (*id.*). These customers desire neither innovation nor any change. The problem of innovation was not from the supply side but the demand side.
- (3) NDC and AnZyx could not attract youngsters because of the limitation of their number. Only pharmaceutical companies used pharmaceutical data and they were already IMS's

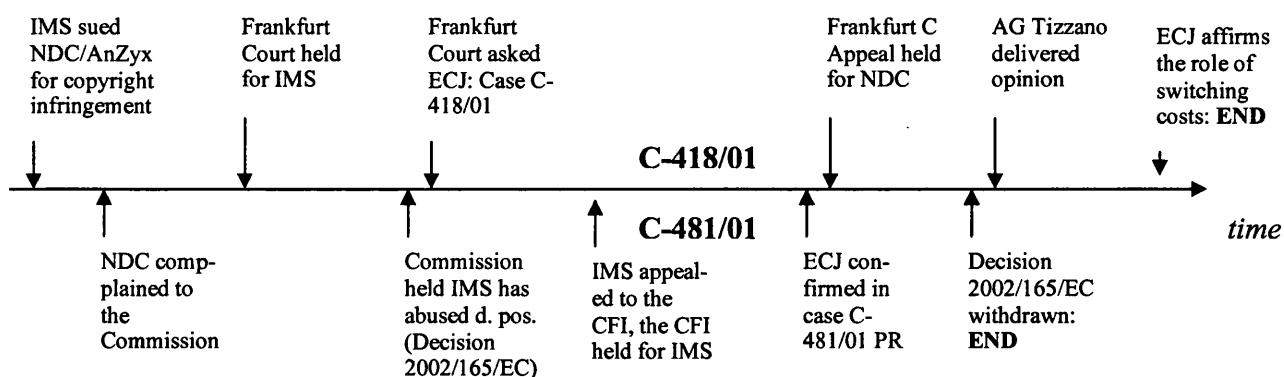
⁷⁰ See the investigation report of *Kyocera/Pelikan*, at XXVth Report on Competition Policy (1995), point 86. At point 87, the Commission held that consumer should always be forward-looking before taking decision.

⁷¹ Decision No. 2001/165/EC, COMP D3/38.044. The case has been decided on 29 April 2004 (C-418/01).

consumers. In this sector, it was hard to find youngsters. Winning the support of the oldsters is the only way competition takes place in this market.

The Commission has ordered IMS to grant NDC with the standardised data format. This order has latter been withdrawn (by decision 2003/741/EC, OJ L 268/69) following an ECJ order ruling that there has been no urgency in enforcing the Commission's decision (C-481/01 P/R). However, before that the Landesgericht Frankfurt am Main has asked the ECJ three questions regarding the interpretation of Article 82 EC, in which one question points to the heart of MIE exploitation: “is [the consumers’ contribution to the incumbent’s standard] relevant to the question of abusive conduct by the [incumbent]?” (C-418/01, opinion dated 2 October 2003, para. 25). The answer of both Advocate General Tizzano and the ECJ is ‘yes’ (No. C-418/01, judgement on 29 April 2004, para. 30). Without waiting for the answer, the Oberlandesgericht Frankfurt am Main has effectively limited the scope of copyright protection of IMS data format and allow NDC to use postcodes as components of its data structure(judgement dated 17 September 2002).⁷² To avoid confusion between two cases: C-481/01 and C-418/01 please refer to the timeline below. As *IMS* relates to MIE control, refusal to license and switching costs, it will be repeated several times throughout this research.

Table 2: *IMS timeline for C-418/01 and C-481/01 PR*



⁷²

The Court held that: “the [entrant] could not simply be prohibited from developing freely and independently a [format] that simply based on [the incumbent’s idea] and for that reasons comprise more or less the [expression as the incumbent did].” (cited from the Decision 2003/741/EC, para. 10).

IMS is an example of a market where the number of youngsters are limited. Even when there is a considerable size of youngsters, there could be a 'chicken and egg dilemma': a youngster could not buy the entrant's product because he is already the oldster in a related market. In addition, a youngster, even when he is not the oldster in any market, would be hesitant to buy the entrant's product, because such a product is unpopular, and he needs a popular product in order to be supported by other related products (*Microsoft* (1999) 165 F.3d 952, Finding of Facts: 24). When both the oldsters and the youngsters demand the MIE, control of the oldsters' demand is equivalent to control of the youngsters (see e.g., Whish, 2001: 173-74). Consequently, there is no market opportunity left for the entrants. The vanishing of investment opportunity will destroy the dynamism of the Schumpeterian efficiency (Schumpeter, 1942: 111).

CONCLUSION

This chapter has presented the relevant legal, economic and technical concepts and principles surrounding the main issue of this thesis: control of interfaces and data formats by a dominant software incumbent. Given the detriment to consumers, the justification for copyright protection on the ground of sunk costs and free riding remains reasonable. However, it remains to be seen whether on balance, consumer welfare will be enhanced if the incumbent can use copyright to refuse licensing the MIE notwithstanding consumer demand. A system of copyright in which social costs exceed social benefits is a poor bargain. Particularly:

- (1) Being public goods, software is vulnerable to free riders. Copyright represents a trade-off between protection and innovation. The trade-off is based on an assumption that social benefits from protection exceed social costs. Otherwise, such a trade-off is inefficient.
- (2) The software sector is characterised by a strong vertical and horizontal network effects, in which the interfaces and data formats play crucial roles in the functionality and management of software programs. As such, there is a public demand for standardised interfaces and data formats, which are called the MIE.

- (3) It is efficient to allow private firms to develop software infrastructures and MIEs. However, the way a standard gains positive feedback or reaches critical mass is not always efficient. It can be a result of leveraging market power, through control of other MIEs. Hence, an MIE control gives rise to an economic rent of the MIE owner.
- (4) Through the MIE, its owner can monopolise the MIE-controlled markets (leveraging). He also has opportunities to exercise pricing and non-pricing conduct over consumers. Such conduct affects not only the oldsters but also the youngsters, if the latter need to communicate with the oldsters, or they are already oldsters in a vertically integrated market. The cases discussed in Section 1.5.3 have shown that the harmful use of MIEs in networked economies is a real and serious threat to the consumers' interests.

All economic models presented in section 1.2, namely Pareto efficiency, Schumpeterian efficiency and Coase theorem, are pre-conditioned on the consumer's freedom to contract. However, as discussed in sections 1.5.2 and 1.5.3, when the MIE control is exploited by an incumbent, his dominant power can be leveraged from one market to another. Consequently, entrants and consumers must follow the incumbent's strategy regardless of their real demand or strategy. The incumbent may counter-argue that a MIE exploitation is allocative efficient because the incumbent is in the best position to meet diversified consumer demands (Bakos *et al.*, 1999; Larouche, 2000: 227-232). Applying the Coase theorem, (see section 1.2.1.a), the incumbent may argue that he is the one who values the MIE the most. However, when consumer choice is limited to zero, it does not matter who values a product the most (Dempsey, 1999: 38). A core solution would be to give more choices to consumers, by facilitating market entry, through MIE license. Otherwise, the MIE owner can prejudice consumers in many ways, at least by leveraging, raising prices or abusively upgrading.

The next chapter will present a literature review of anti-abuse measures, discuss the advantages and disadvantages of these measures in controlling MIE abuse, and find the common thread among them.

CHAPTER II: RETHINKING CURRENT ANTI-ABUSE MEASURES

Although the risks of MIE control is real, one may argue that either the current legal measures would suffice to deal with these risks, or MIE control is unavoidable; legal intervention is unnecessary and can only result in another market failure. Below we take a literature review on the economic arguments (section 2.1), copyright measures (idea-expression dichotomy and reverse engineering, section 2.2), competition measures (the essential facilities doctrine, section 2.3), and specific regulation measures (section 2.4). As will be discussed, the current measures have not paid sufficient attention to the core of abuse, which are consumer interests and network effects. Instead, they have focused on the technical ideas or abstract concepts, such as ‘idea/expression dichotomy,’ ‘freedom of speech,’ and ‘exceptional circumstances’, which are vulnerable to circumvention.

I will not elaborate technology-based arguments, such as convergence and converters, because if the entrants or consumers could avoid being abused solely by technological means, there is no legal issue for this research to begin with. As Clark (1996) said: “the answer to the machine is in the machine.”⁷³ If, as Murray and Scott (2002) have warned, technological measures can only escalate the war between those who adopt the measure and those who try to circumvent the measure, then the danger of abuse and the need of legal measures increases. To narrow the scope of analysis to the relevant issues, I assume that the issue of abuse arises when the entrants have unsuccessfully used technological measures to overcome the system

⁷³

As interoperability is one of the top concerns in software engineering, many technologies have been developed to overcome the problem of network control. Technological solutions have been put in place: software reuse and convergence, changing software engineering methodologies from functional design to object-oriented design, creating reusable tools such as JPEG or Java, open source software or web-services solutions (see 1.3.1.c). However, no matter how technology evolves, it still needs infrastructures, which are characterised by common standards. If standards are privately-owned and the State cannot control it effectively, abuse would likely to incur. That is why antitrust litigation still occurs notwithstanding technological development.

incompatibility problem. On the other hand, whenever it is possible to recourse to technological solutions, such solutions should take priority over the legal or economic measures.

2.1 ECONOMIC ARGUMENTS

2.1.1 THE NEW ECONOMY AND 'INNOVATION DEFENCE'

According to Ahlborn, Evans and Padilla (2001), the 'new economy' is an economy based on information and communication technology. Brian Arthur (1996), Teece and Coleman (1998), and Schmalensee (2000) observe that where network externalities are high, standardisation and monopolisation are necessary to recover the R&D sunk costs and to prevent free riders. Moreover, there is a consumer demand for convergence. When many products come together in one product, such as a mobile phone with a built-in digital camera, markets are converged (see section 1.4.4). These factors have created an inherent demand for bundling, standardisation and co-ordination between different markets.⁷⁴ As standardisation in the new economy is ubiquitous, we cannot avoid it. State interventions in the new economy will be fruitless because either they will deny the Schumpeterian efficiency from innovation, or they do not have sufficient information about the consequence of future intervention.⁷⁵ Eventually, those who control a network must invite downstream companies to join, so that their network will become larger and all participants will benefit from the (horizontal) network effects. In doing so, the network owners will increase consumer benefits.⁷⁶

⁷⁴ For example, the market for media player, camera and photography could converge into the mobile telephone market, and the latter keep "annexing" other traditionally separate markets such as personal digital assistants (PDAs) or laptop computers. For detailed on convergence, see Bing (1996) and *Media Market, Economics: 2.7*.

⁷⁵ According to Teece and Coleman (1998: 801), "antitrust authorities need to be cognisant of the self-corrective nature of dominance." For similar arguments, see Liebowitz and Margolis (1990 and 1996).

⁷⁶ For example, the price competition between Encyclopaedia Britannica and Encarta has driven the sale price down from US\$2,000 a year to US\$49.95 for perpetual use. See Shapiro and Varian (1999: 19).

If standardisation and natural monopoly are obvious trends in the new economy, then the next question is whether market competitiveness can survive. Brian-Arthur (1996) argues that it can, because the dominant power in a new economy is temporary. Ahlborn, Evans and Padilla (2001) summarise the differences between static and dynamic competition as follows.

Table 3: static and dynamic competition

STATIC COMPETITION	DYNAMIC COMPETITION
Companies compete with each other to offer the lowest prices and best features, hence providing benefit to consumers.	Companies compete through innovation. The winners are only 'fragile monopolists' (to quote Keynes (1936): "in the long run, we are all dead [including the monopolist]").
Many companies, few barriers to entry, competition minimises costs for the consumers and eliminates the ability to earn above-normal profits.	Natural monopoly occurs to companies that have the lowest costs and the largest share of markets. Consumers will benefit from the (voluntary) lowering of prices of the products and greater standardisation.
The ability to maintain prices more than marginal cost is the evidence that sellers have some degree of monopoly power.	A successful innovator must charge more than marginal cost to recoup his sunk costs and fund his next projects (which will entail high risks), and to deter free riders.
Companies get normal return, adjusted for risks, on their invested capital.	Winners receive huge profits that offset the huge losses incurred by the losers (in the future).

As the new economy is dynamic, Schmalensee (2000), Bishop and Caffarra (1998: 265) believe that the intervention of competition law may be counter-productive: if competition is fierce, why do we need to improve it? Why do we need a perfectly competitive market if it is not the best way to provide consumer welfare? Eventually, high profit could be the optimal method to attract other firms to enter new markets and improve productivity for the economy. Despite the downturn in the 'new economy' since 2000, statistics from the US Labour Department have shown an increase in productivity, especially amongst service companies, thanks to technological advance (see Hilsenrath, 2003).

As such, allocative efficiency will come by itself, if not in the short-term then in the long-term. Teece and Coleman (1998: 838) and Monti (2003: 19-21) remind that competition law should take into account the long-term effect of innovation; otherwise, it could become obsolete

and counter-productive. In 2001 and 2002 the CFI has turned down the Commission's two merger decisions, *AOL/Time Warner* [2000] Case IV/M.1845 (online music) and *WorldCom/MCI* OJ [1999] L 116/1 (top-level Internet service providers or "ISPs"). The CFI held that the Commission had erred in defining the markets that are highly innovative and dynamic, giving more credit to the 'new economy' arguments.

2.1.2 REFLEXIVITY OF THE NEW ECONOMY THEORY

While the new economy theory has reasonably presented the dynamics of the competition and the risk of sunk costs and free riding, it has relied heavily upon the supply-side arguments and neglected consumer demand and constrained circumstances.⁷⁷ The picture that the new economy theory has drawn is therefore biased. McKinsey & Co. (2002), Willcocks and Lester (eds. 1999) also point out that the above increase in productivity from IT investment may show that the supply side of the market is performing better, but it does not inform whether the demand side of the market can match the capacity of the supply side. In reality, the stagnation in IT and electronic commerce from 1999 to 2003 has shown that the demand for standardisation has not been overwhelming or 'unavoidable'.⁷⁸ Through the development of communication technology in early 20th Century, Yates (1993: 271) demonstrates that technology changes, in themselves, do not solicit consumer demand. Consumers do not respond to convergence or new platform as enthusiastically as the new economy economists

⁷⁷ *Media Market, Legal*: 17 notes that new economy arguments are in contradiction with the position of competition authorities, which assess primarily demand-side substitution and then, at a second stage, take supply into account. As discussed 1.5.1.a above, consumer demand should be considered at first.

⁷⁸ *Technology Quarterly*, "Comeback Kid?" *The Economist* 21 Sept. 2002, noted that IT industry world-wide in 2002 has suffered from US\$750 billion of debt and US\$250 billion of over-capacity, many software programmers become unemployed, and the situation is not expected to recovered until 2005. See also Castells (2001: 105-131).

have said.⁷⁹ The FTC economist Joel Klein (2000) demonstrates that innovative competition is effective only if there is sufficient degree of free access to the innovative market.

In addition, it is not obvious that natural monopolists will serve the consumer interests. They may also abuse of dominant position. Antitrust administrators Francois Pons (2001) and Joel Klein (2000: 11) remark that without taking into consideration the demand side, the arguments about the new economy may lack a necessary balance. The dynamic competition argument has similarly underestimated the compatibility requirement in a network. This argument only pays attention to competition *for* the upstream market (in setting the standard), not the competition *in* the downstream markets (between different products built upon the same standards). Dynamic competition may occur under a multi-layered market structure only when both the upstream and downstream markets are competitive. The consumer base in each market should be sufficiently large to make it worth competing for, as discussed in section 1.5.3.

To prove the impetus of market power in the new economy, Liebowitz and Margolis (1998) refer to competition in the markets for word processors, spreadsheets and desktop publishing . In 1990, WP, Lotus and Adobe captured 50-70 percent of the market. In 1996, they captured only 3 – 20 percent, whereas the market share of their competitors ranged from 70 percent (Quark Express) to 95 percent (MS Word). The authors argue that lock-in is not as strong as we might think . However, this argument does not pay attention to the fact that the PC markets in 1990 and in 1996 were different. Worldwide annual sales of PCs in 1990 were 27 million and 57 million in 1995 (*Computer Industry Almanac*, 2002). A large number, if not the majority, of PC users by 1995 had their PCs pre-installed with Windows 95, with which MS Word, Excel and Quark Express are compatible, whereas WP, Lotus and Adobe PageMaker were still running on Windows 3.1. They only gained access to the necessary interfaces of Window 95 a year later than the releases of Word and Excel (see Clark and Edwards, 1999: 182).

⁷⁹ For example, statistical data from IDC has shown that in 2001 more than 600,000 copies of Windows XP were sold, but at the same time consumers bought 900,000 copies of Windows 98; <<http://www.idg.com>>, last visited 2 Apr. 2003.

In short, the new economy theory of dynamic competition or contestable market is plausible only if the consumers are unbound and their support is sufficient to stimulate competition. This may not be the case when the MIE owner exercises his market power. The only two legitimate concerns are sunk costs and free riding, but these are not the fresh concerns. Having said that, these concerns warrant an in-depth analysis (see Chapter 5 below).

2.2 ANTI-ABUSE MEASURES IN COPYRIGHT LAW

Whilst economic arguments cannot obviate the necessity of legal intervention to correct market failures caused by MIE control, Coble (2000) and Geller (2000) argue that the current legal measures in copyright law are sufficient to prevent abusive conduct. As far as software is concerned, one approach is to focus on the expression/idea dichotomy, i.e., treating MIEs as ideas and therefore not being copyrightable. Another approach is to accept reverse engineering for the purpose of interoperability as a fair use. Though they have been the dominant arguments in the 1990s, their influence on the issue of MIE abuse recently has not gained practical significance.

2.2.1 THE EXPRESSION-IDEA DICHOTOMY

As noted in section 1.1.1, ideas are not copyrightable. If the MIE is an idea, the incumbent can no longer exercise copyright or refuse to license it. However, before accepting that MIEs are ideas, we must determine what an idea is. In *Nichols v Universal Pictures, Inc.* [1930] 282 US 902, Justice Learned Hand said: “no one ever does, and no one ever can” gives a definition of an idea. When the theory is unclear, using it in practice becomes difficult. From *Whelan v Jaslow* [1985] 797 F.2d 1222, where the look and feel test emerged, to *Computer Associates v Altai* [1992] 982 F.2d 693, 721, where the abstraction, filtration, comparison test was found, courts in the US have tried to draw the distinction between expression and ideas without real success (see e.g., Walker, 1997). In UK, justice Ferris has tried in vain to apply the *Altai* test in *Richardson v Flanders* [1993] FSR 497 and Sir Robin Jacob has finally abandoned this test in *Ibcos v Barclays Mercantile* [1994] FSR 275. Bainbridge (1999: 107) concludes that the *Altai* test is only a restatement of *Whelan*, which is an illusion that one could clearly define the

expression and the idea in software through the ‘look and feel’ test. As lines of codes are logically dependent on each other, one cannot abstract or filtrate them as independent elements to determine the generic ideas. He queries that, if no one can define an idea, then why the law relies upon an uncertain principle, even to the highest level as TRIPs.⁸⁰

The abstraction, filtration and comparison test becomes even less helpful when a program is engineered through an object-oriented approach. In the past, software engineers have started from scratch every time they built a new piece of software (Samuelson *et al.*, 1994: 2310). Writing software used to be similar to drafting a book, from ideas to expressions (top-down). Today, software is written bottom-up by converging and reusing pre-existing independent parts (see *Microsoft Europe Decision*, para. 165).⁸¹ Each part represents a different idea (see *Richardson v Flanders* [1993] EIPR 250, para. 44). This approach has changed the old programming methods fundamentally, in spite of what the courts decided in *Whelan* or *Altai*. The failure of the abstraction, filtration and comparison test shows that legal intervention would not be effective when it is based upon inaccurate assumptions.

Compared to ideas, the concept of functional elements is easier to define, but its copyright is doubtful. Initially, the US Supreme Court in *Baker v Selden* [1879] 101 US 99 established a principle that copying a functional element is not an infringement. Justice Keeton in *Lotus v Paperback* [1990] 740 F. Supp. 37 explained that if a particular expression is one of a limited number of ways of expression, then this expression is no longer creative, but functional and is not copyrightable (para. 58). However, under article 10(2) TRIPs only ideas are not copyrightable. For Justice Keeton’s statement to be correct, a functional element must be an

⁸⁰ The idea/expression dichotomy is stated in Article 10(2) TRIPs. For different opinions, see Lai (2000). The court in *Altai* quoted the abstraction-filtration-comparison test from Nimmer (1993), who was a law professor and not a programmer. He believed software could be abstracted, like a book.

⁸¹ Reuse will have the following advantages: (1) enhance system reliability, (2) reduce process risk, (2) specialise software production, (3) embody standards, and (4) saving time. The standard components are called computer-aided-software-engineering tools that can be assembled, reused and interact with each other (CASE, such as MS Access database), see Monteiro (2000); Sommerville (1995: 397).

idea, not an expression. However, ‘ideas’ do not mean the same as ‘functions’ or ‘facts’.⁸² Even if the ways to express an idea are limited, such expressions are not the idea. They are only functional expressions. In *Ibcos Computers Ltd. v Barclays Mercantile* [1994] FSR 275: 29, Sir Robin Jacob explained that the difference between an expression and an idea is not of the nature, but of the ‘degree’. However, he could not explain on what basis such a degree was set.

If we look at judiciary precedents for an answer whether functional elements are ideas, the outcomes are not consistent. In UK, the designs of a lamp, exhaust pipe or a boat are not ideas, although the number of ways to design them is limited (see *British Leyland v Armstrong* [1986] 2 W.L.R. 400). In the US, the conclusion is different.⁸³ Another ambiguity of the ‘functional elements’ is the inconsistency in remedies. Sometimes these elements have been exempted from copyright (by fair use) rather than excluded from copyright protection (see *Atari v Nintendo* [1992] 975 F.2d 932 and *Sega v Accolade* [1992] 977 F.2d 1527). Outside the US and the UK, the copyright of functional elements is even more ambiguous. Although judges in the Netherlands, Germany and France have, on several occasions, either excluded functional elements from the scope of copyright protection or granted exception, their reasoning has not been consistent.⁸⁴

⁸² In *Whelan* [1987] FSR at page 19 ideas were defined as “the purpose or function of a utilitarian work, and everything that is not necessary to that purpose of function would be part of the expression.” This definition has been rejected in *Altai*. Judge Ferris asserts in *Richardson v Flanders* [1993] FSR 497, at para. 19: “a program’s function or purpose is a composite result of inter-acting subroutines. Since each subroutine is a program, and thus may be said to have its own ‘idea,’ *Whelan*’s general formulation that a program’s overall purpose equates with the program’s idea is ... inadequate.” See also *Apple v Computer Edge* [1983] AIP 90-121; and Shneiderman (1998: 115-118).

⁸³ See *Compco v Day-Brite Lightning* [1964] 376 US 234, *Sears v Stiffel* [1964] 376 US 225, *Bonito Boat v Thunder Craft* [1989] 489 US 14. The US Supreme Court held that copying a lamp or a boat design could be functional and exempted from copyright infringement, but the Court did not explain whether functional elements are ideas. For the similar problem of the idea/expression dichotomy in Australia see Lahore (1992: 429) and *Autodesk v Dyason* (1992) EIPR 128.

⁸⁴ See Kamperman-Sanders (1997: 39-45), Kaufman (1985) and Spoor (1995). For Dutch law, see *Tomado v Hazenveld* [1953] HR (1954) NJ 90, *Hyster Karry Krane* [1954] HR NJ 90 and *Scrabble* [1960] HR NJ 415. For German law, see *IMS* (1.5.3 above). For French law see *Decoras v Art Metal* [1991] PIBD 510 II-655 and *Lego v Tomy* [1996] 5 IIC 729.

In short, the idea/expression dichotomy alone cannot solve the issue of MIE abuse. Looking at a software program as a whole, functional elements are not always ideas. These elements are dependent from each other as the key to the lock. In terms of policy, excluding MIE or functional elements from the scope of copyright by labelling it as an ‘idea’ is inefficient. It extorts the incumbent’s fruit of labour in the functional elements; which in turn may stifle innovation. Landes and Posner (1989: 352) conclude:

“We hope the [idea/expression] debate will be resolved not by the semantics of the words ‘idea’ and ‘expression’ but by economics of the problem and specifically, by comparing the deadweight cost of allowing a firm to appropriate what has become an industry standard with the disincentive effects on originators if such appropriation is forbidden.”

2.2.2 REVERSE ENGINEERING

Even when a MIE is construed to be an idea, making use of it is difficult if its source code is not revealed. To find the source code and understand it, two steps must be performed: decompilation and reverse engineering.⁸⁵ Reverse engineering encompasses several methods to derive the design or specification of a program, especially the data structure and dependencies, from its source code. These methods are similar to disassembling a machine, studying it to produce a better machine or another machine that could interact with the original machine. Another method similar to reverse engineering is data re-engineering, i.e., fitting old data to the new format (Somerville, 1995: 722).

If the idea/expression dichotomy does not solve the problem of MIE abuse, could the copyright exception/fair use for reverse engineering for the purpose of interoperability be the answer? Although the answer is yes in theory, as introduced in section 1.1.1.c, in practice reverse engineering is no longer an efficient solution to the issues of MIE abuse and system

⁸⁵ The released version of a software program is the object codes, or embedded in hardware, ineligible to human. To ‘read’ these codes, they must be decompiled into source codes. Afterwards, software engineers will “reverse-engineer” the source codes to find the original structure of the program and algorithm. Reverse engineering include (1) reading about the program, (2) observing the program in operation, (3) performing a static examination of the individual computer instructions contained in the program; and (4) performing an examination of the individual computer instructions as the program is being run on a computer (Johnson-Laird, 1994: 846).

incompatibility. Provisions on reverse engineering were introduced at a time when it was not difficult to reverse engineer or to prevent it (1991 in the EU and 1992 in the US). As Muller *et al.* (2000), Tilley and Huang (2001) demonstrate, today when the incumbent discovers that competitors have reverse engineered his design and produced compatible products, he can simply change some codes of the original interfaces through upgrading, discouraging the competitors' effort to achieve interoperability.

a. The reverse engineering exception under the EC law and US law

Art 6 of the *EC Software Directive* (No. 91/250/EEC dated 14 May 1991) states:

- “1. The authorisation of the rightholder shall not be required where reproduction of the code and translation of its form ... are indispensable to obtain the information *necessary* to achieve the *interoperability* of an independently created computer program with other programs, provided that:
 - a. these acts are performed by the licensee ...;
 - b. the information necessary ... *has not previously been readily available* ...; and
 - c. these acts are confined to the parts of the original program, which are *necessary* to achieve interoperability.
2. The provisions of paragraph 1 shall *not* permit the information obtained ... to be used for development ... of a computer program *substantially similar* in its expression, or for any other act, which infringes copyright.
3. In accordance with the provisions of the Berne Convention, the provisions of this Article may not ... allow its application to be used in a manner which *unreasonably prejudices the rightholder's legitimate interests* or *conflicts with a normal exploitation of the computer program.*” (Emphasis added, see also Article 5.5 of Directive 2001/29/EC on copyright in the information society).

These provisions when put into practice have faced three difficulties. Firstly, the prohibition against reverse engineering of a program is legal except for ‘necessary’ parts. As Hart (2000),

Behrens and Levary (2000) point out, in order to identify which part is necessary in the original program, the whole program must be re-engineered.

Secondly, in order to avoid unauthorised reverse engineering, the rightholder may prohibit the licensees to reverse engineer its program. Alternatively, the incumbent can make some of his interfaces available to competitors (e.g., the application programming interfaces or APIs) in order for the latter to achieve interoperability, but these by no mean ‘as interoperable as’ the incumbent’s products (see *Microsoft Europe*, section 4.2.2 below).

Thirdly, even when all the conditions of Articles 6(1) and 6(2) in the Directive have been fulfilled, the incumbent may rely on the *Berne’s* three-step test to hold reverse engineering illegal, because of its conflict with a ‘normal exploitation’ of the software program (see section 1.1.1.c and Chapter 7 below). There has been hardly any case successfully defended against the three-step test. In *Mars v Teknowledge* [2000] ECDR 99, the UK High Court dismissed the ‘must-fit, must-match’ defence of Teknowledge, who reverse-engineered and modified the computer program used in vending machines to allow the machines can accept new coins. Judge Jacob held that this conduct has interfered with Mars’ normal exploitation of its software.⁸⁶

In the US, the fair use exemption for reverse engineering to achieve interoperability is underpinned by three cases, *Sega v Accolade* [1992] 977 F.2d 1510, *Atari v Nintendo* [1992] 975 F.2d 932 and *Sony v Connectix* [2000] 203 F.3d 596.⁸⁷ The most typical case, *Connectix*,

⁸⁶ Outside the EU, Singapore’s High Court in *Creative Technology v Aztech System* [1997] 1 SLR 621 based its ruling on the three-step test, deciding that even reverse engineering for the purpose of study conflicts with a normal exploitation of the work; if knowledge from that study can be used to write another commercial software program (see Miandah and Karuppiah, 1999: 8.83; Lai, 1999).

⁸⁷ In *Sega*, the defendant (Accolade) has reverse engineered Sega’s video games to find its interfaces with Sega’s game console, so that Accolade’s interfaces (Ishido) could be compatible with Sega’s game console. The Ninth Circuit held that an interoperable program has benefited the public by enhancing competition and public choice, and was therefore a fair use, although as a consequence the sales of the Sega has been diminished. In *Atari*, the Court held that what Atari copied from Nintendo was more than necessary and therefore the act of reverse engineering was not a fair use.

involves the copying of the interfaces in an operating system (BIOS), which had connected the applications (Sony game discs) and the hardware (the Play Station console). Connectix has designed another operating system (so-called Virtual Game Station) that connected Sony's applications with a PC, so that users could play Sony's game without having to buy a Play Station console.⁸⁸ One may argue that Virtual Game Station has competed directly with BIOS, affecting Sony's 'normal exploitation' and 'legitimate interests' in BIOS marketing. Nevertheless, the Court still held for Connectix, as it has only copied the unprotected elements in the BIOS.

b. Reverse engineering from practical perspectives

During the 1980s and early 1990s, reverse engineering was considered an efficient business method.⁸⁹ However, it was used only in simple cases.⁹⁰ *Sega, Atari* and *Connectix* were related to games, with respect to firmware embedded in chips. This embedded platform was not easily be modified. Therefore, competitors may market an interoperable product for some time until the incumbent replaces the reversed engineered firmware. Reverse engineering in order to market interoperable products have been much less successful. What Connectix could do with PlayStationI is now infeasible with PlayStationII. BIOS is no longer embedded into the hardware. It is now a software program. This also means that Sony can randomly change the software interfaces to prevent reverse engineering.⁹¹

⁸⁸ A Play Station console costs more than US\$200. Virtual Game Station costs only US\$80. At the same time, Sony has an installed base in 1992 of 85 million Play Stations (see Samuelson and Scotchmer, 2002).

⁸⁹ See report from the Office of Technology Assessment (1994).

⁹⁰ See also *Triad Systems Corp v Southeastern Express Co.* 64 F.3d 1330 (9th Cir. 1995). Other cases involving reverse engineering include *DSC v DGI* 91 F.3d 597 (5th Cir. 1996), *Bateman v Mnemonics* 79 F.3d 1532 (11th Cir. 1996), *Mitel v Iqtel* 896 F.Supp. 1050 (D. Colo. 1995).

⁹¹ Connectix no longer supported Virtual Game Station, after its game division has been acquired by Sony in March 2001, <<http://www.connectix.com>>, accessed 15 Mar. 2003.

Nowadays reverse engineering has become less helpful and more difficult to exploit. The gap between the old and the new technologies has been widened, and software programs now become more complex. For example, one cannot reverse engineer a program written using a functional approach to an object-oriented program (Sommerville, 1995: 702). Likewise, the data format control in the old system could hinder the data re-engineering process.⁹² The incumbent might also prevent a reversed engineered product arising, by changing some codes in his existing interfaces, or inserting another virtual layer between the two existing layers that can block the competitor's products (see e.g., *Sun v Microsoft* [1998] 21 F. Supp.2d 1109, in section 5.4.3.b below). In another case (*Microsoft Europe*), Sun has testified before the Commission that a reverse engineer of complicated software such as Windows is economically impractical:

“The market reveals no company which has succeeded in [Windows’] reverse engineering effort. The barriers and costs are competitively prohibitive. The Win32 API set alone, for example, includes over 2500 separate interfaces, each of which implicates series of actions which take place somewhere within the over 40 million lines of compiled source code that makes up the Microsoft Windows systems. [...] Several years ago, Sun embarked on an ambitious program ... to reverse engineer the then Win32 APIs. [...] After dedicating millions of dollars and years of engineering [in] a much less complex version of Windows NT, Sun abandoned the project after became clear that a successful implementation of the APIs was unobtainable.” (*Microsoft Europe Decision*, para. 455; see also paras. 683-687).

In addition, O’Rourke (2000: 32) asserts that the incumbent can deny supporting services to the consumers who had used reverse-engineered software because they do not have a ‘seal of approval’. Somerville (1995: 703) also observes that a re-engineered system is not easy to maintain. With the increasing concern about security over the Internet, less success on reverse

⁹² The process of data re-engineering consists of two stages. Stage 1 is data analysis, and stage 2 is data re-formatting, converting default value and validation rule (see Behrens and Levary, 2000: 20). Rickets, DelMonaco, and Weeks (1993) note that data re-engineering may not work if there is a inconsistency between two software layers. These inconsistencies can be default values, validation rules, units, representation semantics, and handling of negative values. In 2000 I have interviewed Mr. Sanjay Prasad, chief patent lawyer of Oracle at Mountain View, CA on the danger of reverse engineering to a company’s business. Mr. Prasad denied the danger, saying that it would take years for competitors to reverse engineer and understand Oracle’s programmes; and the costs involved are prohibitive.

engineering to achieve interoperability has been reported, in law and in fact.⁹³ In the US, the Digital Millennium Copyright Act (DMCA 1999) also prohibits any act for the purpose of circumvention of an effective technological measure of the rightholder. Such a prohibited act may include reverse engineering.⁹⁴ A similar approach has been adopted in Europe under Article 6 of the Directive 2001/29/EC on copyright in the information society (“IS Directive”).

Another approach of reverse engineering is to design an adapter (middleware, converter or gateways, see *Microsoft Appeal*: 12). The program Adapter in *Computer Associates v Altai* [1992] 982 F.2d 693 is an example.⁹⁵ The problem with an adapter is also that the incumbent may also study the adapter through reverse engineering and make his product incompatible with the adapter in the next version. Moreover, consumers prefer unified standard to converters. For example, although converters between Apple Macintosh’s APIs and Microsoft Windows’ APIs, such as Connectix’s Virtual PC are available, they are not stable. Microsoft can also change its APIs through the ‘upgrade’ process when it discovers too many people using converters.⁹⁶ Converter does not solve the problem of incompatibility. Instead, it provides an incentive to make products less compatible with each other to avoid intrusion of the adapter.

⁹³ For example, Microsoft has made its basic APIs available for competitors to design applications on Windows, and yet no applications have come up with equivalent functions of Microsoft Office. See Samuelson and Scotchmer (2002).

⁹⁴ *Lexmark v Static Control* (in CED, 2004: 46) is an example. Lexmark, one of the top US manufacturers in computer printers, has tried to stop other companies from supplying cartridges for its printers by installing micro chips in their printers, that cause the printers to malfunction if replacement cartridges do not come from Lexmark. Static Control designed a chip that could decode Lexmark chip, and was sued by Lexmark that it microchip has spoofed copyright software in Lexmark’s chips, violating the DMCA.

⁹⁵ Adapter was a component of the application CA-Scheduler. It helped the task-specific component to run on any IBM mainframe operating systems: DOS/VSE, MVS or CMS. Altai has recruited an ex-employee of CA to design its program that has similar functions to Adapter, so-called ZEKE. Functional features of Adapter had been copied to ZEKE. Non-functional features have been removed in the next release of Altai’s products through a so-called “clean room” technique.

⁹⁶ Virtual PC allows Mac users access to Windows applications, <<http://www.connectix.com>>, accessed 30 June 2003. In fact, Connectix has stopped to release Virtual PC since the acquisition of Microsoft.

2.3 COMPETITION MEASURES AGAINST ABUSIVE REFUSAL TO LICENSE

Having reviewed copyright measures to the MIE abuse problem, we now analyse whether competition rules could provide a solution. The objective of competition measures are either to require the incumbent to grant a compulsory MIE license to the entrant under the ‘essential facilities’ doctrine (EFD), or to prohibit the incumbent from pursuing anticompetitive conduct, such as charging excessive prices, tying or bundling (see Goyder, 2003: 284-295). These are ‘substantive’ rather than ‘procedural’ rules (see section 1.1.2.c). They do not regulate the burden of proof of the parties so that the court can later take a cost-benefit analysis, but rather set out the court’s view on how competition can be created in a bottlenecked market.

In Europe, the first doctrine involving abuse of intellectual property rights is the ‘existence/exercise dichotomy’, found in *Consten and Grundig* [1966] ECR 299. According to this doctrine, an intellectual property rightholder may abuse his dominant position, not by the mere existence, but by the exercise of his rights (see e.g., Philips and Firth, 2001: 410).⁹⁷ However, the importance of this doctrine was minimised by *Volvo v Veng* [1988] ECR 6211. In this case, the ECJ has admitted that the right of refusal to license “constitutes the very *subject-matter* of [copyright].”⁹⁸ The existence of intellectual property rights would have no meaning if the right of refusal to license were not exercised.

⁹⁷ In *Consten and Grundig*, Grundig had separated the German market from the French market by using two trademarks for its television: GRUNDIG in Germany and GINT in France. The ECJ ruled that although Grundig has legal rights in GINT (the *existence*), it has *exercised* its intellectual property rights to restrain trade between France and Germany. In other words, the ECJ condemned the anti-competitive *intention* of Grundig, not the right that Grundig owned.

⁹⁸ In the US, the Supreme Court in *Berkey Photo v Eastman Kodak* 603 F.2d 263 (2nd Cir. 1979) also held that refusal to license is a normal exercise of the rightholder.

2.3.1 THE ESSENTIAL FACILITIES DOCTRINE IN THE US AND EUROPE

a. *The essential facilities doctrine in the US*

In the US, the issue of abusive refusal to supply (or to license) is addressed by the essential facilities doctrine (EFD). Essentially, the EFD requires the owner of an essential facility to grant access of the facility to the entrant, if the latter can prove that there is no reasonable way for competition to be accommodated absent equal access. Sullivan and Jones (1992: 176) assert that in many respects the essential facility concept tends to merge into other aspects of the leverage theory (see section 1.5.2). Both theories deal with the extension of monopoly power from one part of the market to another part, or from one market to another market.

The genesis of the EFD began nearly a century ago, in the case of *US v Terminal Railroad Association* [1912] 224 US 383. Terminal Association (TA) controlled access to the only rail bridge across the Mississippi River to St Louis. TA allowed only its member railway companies to have access to the rail bridge. Non-member railway companies brought an antitrust lawsuit under § 1 Sherman Act, complaining that TA had attempted to monopolise the St Louis railway market. TA argued that its refusal to supply the competitors was a matter of freedom of contract and an exercise of property rights. The Supreme Court rejected this argument, stating that property rights were not absolute. It had concluded that the bridge was essential for the railway companies operating in the St. Louis region and requested TA to grant the terminal access for its competitor. The principle from *Terminal Railroad* has later been adopted in *Associated Press* 326 US 1 (section 1 Sherman Act) and *Otter Tail* 410 US 366 (section 2 Sherman Act, see Sheehan, 1999: 79), but the Supreme Court has never expressly used the term EFD.⁹⁹ In 1982, the EFD was developed by the Seventh Circuit in *MCI v AT&T* 708 F.2d 1081, at 1132-33: “a monopolist control of an essential facility can *extend from* one stage of production *to* another ... The antitrust laws may impose on (this) firm ... the obligation

⁹⁹ See *Verizon v Trinko* [2004] Case No. 02-682 and Sheehan (1999: 77-79)

to make the facility available on non-discriminatory terms.” This obligation is established when:

- (1) the essential facility is controlled by a monopolist;
- (2) the owner of the facility has unreasonably denied access of the facility to the competitor;
- (3) a competitor cannot practically or reasonably duplicate the facility; and
- (4) the grant of access to the facility would be feasible.

b. Refusal to supply and the exceptional circumstances doctrine in Europe

With respect to tangible assets, the European approach to refusal to supply is similar to the EFD in the US (Whish, 2001: 611-12). In *Commercial Solvents v Commission* [1974] ECR 223, the ECJ held that a dominant firm by refusal to supply an existing customer an essential facility has abused its market power, if by doing so competition in the downstream market was eliminated. The formula: ‘*refusal to supply + elimination of competition = abuse*’ was confirmed again in *Hugin v Commission* [1979] ECR 1869 and *Telemarketing v CTL* [1985] ECR 3261. Most refusal to supply cases had related to ‘essential facilities’, be it raw materials (*Commercial Solvents*), spare parts (*Hugin*) or information (*Telemarketing*). However, the Commission had not mentioned the term EFD until the early 1990s (see e.g., Lang, 1994: 475; Albors-Llorens, 1999: 461). In 1994, the Commission used this name for the first time in the interim measure against *Sea Containers* and *Stena Sealink* OJ [1994] L 15/8. In 1998, the European Commission officially defined the notion of EFD as a “facility or infrastructure, which is essential for reaching customers and/or enabling competitors to carry on their business, and which cannot be replicated by any reasonable means” (*Access Notice*, para. 68).

In 1995, the EFD seemed to expand its application to intangible assets in *Magill* (see section 1.1.3.a above).¹⁰⁰ In paras. 52-56, the ECJ has stipulated that the existence or the exercise of an intellectual property right might become an abuse under ‘exceptional circumstances,’ when:

- ◆ There is a consumer *demand* for a new product, which the dominant firm has failed to satisfy.
- ◆ There is no objective *justification* for the dominant firm to refuse to license.
- ◆ The refusal to supply has reserved to the incumbent the secondary market by excluding *all competition* in that market; in this case by denying access to an essential facility, which is *indispensable* for competitors.

In April 2004, the ‘exceptional circumstances’ doctrine in *Magill* is narrowed under *IMS* (C-418/01), after previous similar effort in *Tierce Ladbroke* [1997] ECR II-923 and *Bronner* [1997] ECR I-7791. The ECJ emphasises that one of the conditions for a refusal to license to be held abusive is the *capacity* of the incumbent to exclude *all competition* in a market by such refusal (C-418/01, para. 47).

Whish (2110: 615) demonstrates that there is no conceptual distinction between the *Commercial Solvents* doctrine, the exceptional circumstance doctrine in *Magill* and the EFD in the US. This is why AG Jacobs had used EFD cases in the US as a source of comparison in his opinion on *Bronner v Mediaprint* [1998] ECR I-7791. For this reason, the term EFD will be used in this thesis in deference to the weight of literature that deploys it, with a note that the doctrine in Europe is the one that derived from *Commercial Solvents*.

Nevertheless, from *Magill* to *IMS*, it is still unclear why the ‘exceptional circumstance’ doctrine can only apply to intangible assets and not tangible assets; who are ‘consumers’ and what is ‘consumer demand’; what might count as ‘justification’ and why only the ‘elimination of all competition’ would be qualified as ‘exceptional circumstance.’ (See also e.g., Greaves, 1998 and Anderman, 2002). Perhaps the answer is that courts do not take the words in the

¹⁰⁰ Vinje (1995) and Heinemann (2000: 310) note that *Magill* is a definitive farewell to formalistic thinking in European intellectual property competition law (the existence/exercise dichotomy in *Consten/Grundig*).

‘exceptional circumstance’ doctrine seriously. According to Vinje (1995), the difference between the US *AT&T* four-part test and the *Magill* three-part test seems apparent in words but is not significant in practice. Goyder (2003: 325) observes that courts in both jurisdictions have rarely applied these tests strictly word-by-word. Instead, they have struck a balance between costs and benefits and comparison between the interests of three actors: the dominant firm, the entrants (who apply for access) and the consumers. AG Tizzano in his *IMS* opinion emphasised that Article 82 is a flexible instrument, designed to deal in complex factual scenarios, it cannot be reduced to a checklist, although “a careful analysis of the circumstances and effects of behaviour will be necessary to assess its likely application” (see Treacy and Heide, 2003). The report of member countries in OECD (1999: 196) concludes:

“One must not get lost in the concept of a ‘doctrine’. Nor should one engage in further legal formalism with simple rules. Rather, one must rely on economic analysis with a clear understanding of the economic goals of the policy ... [and] the boundaries of the doctrine.”

If the courts do not treat the words of the EFD or the ‘exceptional circumstances’ seriously, and if these doctrines are in fact a balance between costs and benefits, then why should we not use cost-benefit analysis to solve refusal to license cases? This question will be analysed throughout Chapters 3, 4 and 5 and will be crystallized in section 5.5. At the moment, we shall see how problematic the EFD and the exceptional circumstances doctrine are with regard to intellectual property context.

2.3.2 CHALLENGES AGAINST THE ESSENTIAL FACILITIES DOCTRINE

Intellectual property in itself does not necessarily result in market power, and the incumbent’s usage of vertical integration is generally pro-competitive.¹⁰¹ In *Verizon v Trinko* (judgement dated 13 Jan. 2004, sec. III), Justice Scalia said:

¹⁰¹ The US *IP Guidelines*, Secs. 2.0 and 4.1.2: “the fact that intellectual property may in some cases be misappropriated more easily than other forms of property may justify the use of some restrictions that might be anti-competitive in other context.”

“Firms may acquire monopoly power by establishing an infrastructure that renders them uniquely suited to serve their customers. Compelling such firms to share the source of their advantage ... may lessen the incentive ... to invest in those economically beneficial facilities. Enforced sharing also requires antitrust courts to act as *central planners*, identifying the proper price, quantity, and other terms of dealing – a role that they are ill suited. Moreover, compelling negotiation between competitors may facilitate the supreme evil of antitrust: *collusion*.” (Emphasis added).

In Europe, AG Jacobs has concluded as follows in his opinion on *Bronner*, at para. 57, after summarising the shortcomings of EFD in both the US and Europe:

“In the *long term* it is *generally* pro-competitive and in the interest of *consumers* to allow a company to retain for its own use facilities which it has developed for the purpose of its business. For example, if access to a production, purchasing or distribution facility were allowed too easily there would be no incentive to a competitor to develop competing facilities. Thus while competition was increased in the short term it would be reduced in the long term. Moreover, incentive to invest in efficient facilities would be reduced if its competitors were, upon request, able to share the benefits...” (Emphasis added).

AG Jacobs and Justice Scalia, as well as many other authors, are concerned with the negative impact of EFD upon the rightholder. In the European version of this doctrine, the owner of the facility (the incumbent) is required to provide the entrants access to the facility on a non-discriminatory basis. Since the terms of access is non-discriminatory, it does not give the incumbent a chance to select the licensees, even if some entrants may bring less consumer benefit than others do. As all entrants are treated the same, the facility is vulnerable to free riders. Lang (1994: 475), Bergman (1999:2) and Goyder (2003: 320) criticise that the EFD may promote competition in the downstream market, but it may encourage free riding and deter innovation at the same time.

In addition, as Larouche (2000: 197-98) noted, the application of EFD might not be cost-efficient. The Supreme Court in *Matsushita v Zenith* [1986] 475 US 574, at 594 also stated: “mistaken inferences and the resulting false condemnations are especially costly, because they

chill the very conduct the antitrust laws are designed to protect.” The EFD would inflict costs on the dominant firms. The Commission and the Courts also bear the costs from obtaining, verifying information and enforcing the decision (Larouche, 2000: 201). From the benefit side, only the applicant for access to the facility has an obvious gain. The consumers’ long-term benefit is uncertain. Hence, imposing a general duty to grant access remains difficult except in extreme cases.¹⁰² In theory, we can calculate the consumer benefits by comparing the input/output in the market before applying the EFD to those arising after the EFD, but no method has been established to calculate this way (*id.*: 199).

2.3.3 OTHER ANTI-ABUSE MEASURES

If the EFD is criticised, then a query arises whether other antitrust measures against pricing and non-pricing practices may be used to prevent the MIE abuse, such as the prohibition against a dominant firm from charging unfair price or bundling unrelated products into a platform.¹⁰³ As discussed below, other anti-abuse measures also face similar challenges as the EFD: they have ignored the dynamic of competition and the balance between the costs and the benefits of the measures from the consumer’s perspective.

Competition measures against ‘unfair’ pricing practices is based on a principle that a competition authority may adjust prices if they do not commensurate with the fair market value (FMV) of the product (see *General Motors* [1975] ECR 1367, in Goyder, 2003: 280-281). This approach does not undermine copyright in the MIEs, and it could be more effective than the EFD in theory. In practice however, competition authorities have been very reluctant to become the price regulator of the MIE owner (Korah, 1992: 98-99, *General Motors* [1975] ECR 1367

¹⁰² Larouche (2000: 210-11), citing *B&I Line, Sea Containers* and *Magill* for extreme cases, and *Consten and Grundig, Telemarketing* and *Bronner* for obscure cases. Larouche (*id.*: 212) has also differentiated bottleneck cases (such as *Sea Containers*) from classical cases of refusal to license (such as *Commercial Solvents*), and notes that bottleneck cases are easier to apply the EFD than other cases.

¹⁰³ See *Tetra Pak International A.B. v Commission* [1994] ECR II-755. Regarding the definition of excessive price, predatory price and price discrimination, see section 1.3.2(b) above.

and *British Leyland* [1984] ECR 226). In *Thetford v Fiamma* [1988] ECR 3585: 19, the ECJ emphasised: “if intellectual property (is to) ... foster creativity, its very function is to enable holders to charge whatever the market will bear.” The application of competition measures against predatory pricing and price discrimination would face the same challenge, i.e., how to assess the costs and the benefits of the sanction to the consumers in the long term.¹⁰⁴

Competition measures against non-pricing practices also face the similar challenges. At the moment, if the incumbent cross-subsidises, ties or bundles its products into a package without justification, the competition authority can un-bundle these products, forcing the dominant firms to sell certain products on a stand-alone basis.¹⁰⁵ The reason is that tying and bundling in the long-term may harm competition when the market is monopolised (Goyder, 2003: 283-84). However, this prediction is criticised as speculative. What is certain, according to Larouche (2000: 230), is that consumers can save costs through bundling and price discrimination, as they can maximise the use of one package at a lower cost. The anti-competitive impact of bundling is not yet conclusive.¹⁰⁶

2.4 SECTOR-SPECIFIC REGULATION FOR INFRASTRUCTURAL ELEMENTS

If both the current copyright law and competition law cannot provide adequate solutions for the abuse of MIE, the next question is whether a sector-specific regulation (or, as the *Market Guidelines* call it, *ex ante* regulation) should be introduced. The underlying principle for sector-specific regulation is that when an exercise of property rights affects many stakeholders, the person who controls the property will owe a special duty to take care of these stakeholders. A

¹⁰⁴ Varian (1995 and 1998), Katz and Shapiro (1999), Teece and Jorda (1992: 93 and 151) argue that thanks to price discrimination – or ‘Ramsey’ pricing, consumers may enjoy benefits of low priced products.

¹⁰⁵ These measures have been exercised in *UPS/Deutsche Post* OJ [2001] L125/27, or in *CCIA* (2003b), against Microsoft’s practice to bundle Windows Media with its Windows XP operating system.

¹⁰⁶ See OECD (2000a: 152-54), Carter and Wright (1999: 23). Regarding the policy of unbundling local loop in Europe, see Larouche (2000: 1-35), for the policy of communication interconnection in the US, see Noam (2001: 117-82).

typical example is the duty of the owner of an upstream water reservoir to allow the flow of water to his neighbours downstream, entitled *aqua* in Roman law. This servitude required residents in higher land to allow the residents in the lower land to benefit from the water as well.¹⁰⁷ Sector-specific regulations are now governing many sectors such as public transportation, public roads, water, electricity and telecommunication.

Beniol (2003) suggests that we can implement the idea of sector-specific to the software sector, by making an analogy between software and telecommunications. With respect to the latter, Larouche (2000: 359-368) demonstrates that telecommunication sector needs sector-specific regulation more than competition law, due to the following reasons:

- (1) Telecommunication is strongly affected by both the direct and indirect network effects. If these effects are governed properly, then the right signal for price or profits sent to the market players can stimulate them to compete and bring about consumer welfare.
- (2) Telecommunication serves both economic and non-economic goals.¹⁰⁸ Competition law could be suitable to regulate the first but not the second goal.
- (3) Competition law is an inefficient governance method. Competition litigation is costly and requires experience from both the courts and the parties.¹⁰⁹ On the contrary, sector-specific regulation is simpler to impose and can have a broader scope of application.

¹⁰⁷ *Aqua* principle still applies today in many civil law countries (Burdick, 1939: 385; Kaizer 1968: 92). A comparable common law doctrine is the duty of the *common carrier* (rail road and telegraph companies, see *Anderson v New York Tel. Co.* [1974] 320 N.E.2d 647; see Koelman, 2000: note 165).

¹⁰⁸ See the concept “universal service” is from AT&T President Theodore Vail (1915), who referred to the telephone as a ‘necessity’ to the public (public utility), therefore it needs special attention and special protection (natural monopoly). Larouche (2000: 362), quoting para. 1 of GATS Annex on Telecommunications [1994] OJ 336/209. See also Noam (2001: 12) and Black (2001: 166-68) for the liberalisation of telecommunication networks in NAFTA countries.

- (4) Sector-specific regulation is legally and politically justified, with respect to the fundamental individual rights to gain access to the telecommunication service, to help citizens to exercise the freedom of expression or other rights in networked economies.

Larouche's arguments may be analogical to software. However, there are material differences between the two sectors. In Europe, the mandate for telecommunication regulation is recognised not only by doctrines but also by law, under Articles 86(3) and 95 of the EC Treaty.¹¹⁰ In other words, sector-specific regulation does not only protect competition but also create competition. The law has not granted the software sector such a mandate. Moreover, the two sectors are different in the way the infrastructures are developed and created.

Firstly, from historical perspectives, telecommunication infrastructures used to be controlled by the government, either by way of ownership or by strict regulations. Many telecommunication companies in Europe were public undertakings.¹¹¹ Even in the US, where telegraph and telephone infrastructures were originally invented and developed by private companies; in the later stage, the state extended control over them. Standage (1998) analyses the history of the telephone and telegraph and concludes that the state must intervene in telecommunications because either the costs of developing a standard (in the case of telegraph)

¹⁰⁹ Posner (1998b: 232) notes that the US government's investigation against AT&T examines about seven million documents, and compliance with the investigation request would cost hundreds of million dollars. Ewing (2003: 21-37) compares budgets for competition authorities among 39 countries and come up with remarkable figures: the worldwide antitrust budget in 2000 is US\$600 million, in which US\$257 million was allocated to the US. The figure will certainly be higher if we include lobbying effort and expenditure of the parties involved in antitrust litigation.

¹¹⁰ John Temple Lang (1994) described that "the essential facilities principle is, in effect, the follow-up of Article 90 EC (now Article 86 EC)." See Anderman (1998: 204). Noam (2001: 3-10) notes that the unbundling process in telecommunication sector could not be explained merely by economic reasons, but it was a combination of technological, economic and political forces.

¹¹¹ Larouche, *id.*: 92 observed that by 1998 many EU member states still had a large state capital participation in their incumbent telecommunication providers, such as Belgacom (50%), Deutsche Telekom (60%), France Telecom (75%) or Telia (100%). Public undertaking are defined as "any undertaking over which the public authorities may exercise directly or indirectly a dominant influence by virtue of ownership of it, their financial participation therein, or the rules which govern it." (Art. 2 Directive 80/273).

or the risks of abuse (in the case of telephone) have been too high. The development of software infrastructures is very different. As noted in section 1.3.3, software standards have been developed bottom-up.¹¹² Government cannot decide what the standards are or will be, or how they should be developed. On the contrary, telecommunication standards are usually built top-down (e.g., GSM, CDMA or W-CDMA, see Larouche, 2000: 380-382).

Secondly, OECD (2000) and Werle (2001) demonstrate that telecommunication standards are less numbered, less diversified and less flexible than software standards. The speed of penetration in information technology has also been faster than it was in fixed-line telecommunication technology.¹¹³ A rigid top-down regulatory regime as it applies to the telecommunication sector may not be suitable to the software sector, where technology is constantly evolving through bottom-up development (see also *Market Guidelines*, para. 32).

Moreover, software infrastructures have a global dimension and require governance by broadly accepted principles, whereas telecommunication infrastructures can be regulated by national regulations. Larouche (2000: 94) notes that each telephone user must use a national service provider (local loop), and afterwards the service provider will carry signals abroad. Compatibility is critical among the telecommunication companies, not between these companies and the telephone user. The local loop will dictate the standard for the user. One cannot say the same for software standards. When the issue is global, the solution cannot be nationally bounded. So far, there is no global sector-specific regulation for software.

Thirdly, the impact of system compatibility on telecommunications is stronger than it is on software. The study of Noam (2001: 57) and the statistics of the OECD (2000a: 152-54) show that in telecommunications, network providers have a mutual interest in opening their networks.

¹¹² During the 1980s, the EU standard agencies had spent R&D effort and capital investment in supporting OSI, a different Internet standard than TCP/IP but in vain.

¹¹³ According to ITU (1999), in order to achieve the first 50 million users, telephone took 74 years, radio took 38 years, PC took 16 years, TV took 13 years, but the world wide web (www) took only 4 years.

For example, not only has Orange (a small mobile telephone network) an interest in interconnecting with Vodafone (a large mobile telephone network) but Vodafone also has an interest in interconnecting with Orange, because both could charge higher fees for cross-network calls. Software is different. Microsoft does not have a strong incentive to share its APIs with Word Perfects (WP) as WP has with Microsoft. Hence, the state cannot persuade Microsoft to share APIs with WP, and argues that it has done so in Microsoft's best interests.

Fourthly, with respect to the argument that competition law regulations are more expensive and less efficient than sector-specific regulations, assuming it is true, cannot be a valid reason to use sector-specific regulations as a substitute for competition law. In order to apply a sector-specific regulation, the circumstance to which it applies should be stable in the near future. As discussed in sections 1.2.3 and 2.1, software as a whole is a dynamic sector, technological development could make the old law obsolete. As CED (2004) points out, to avoid putting the cart before the horse, the law should follow technological changes and not lead them. As seen in section 2.2.1 above, one should not forget that the 'abstraction-filtration-comparison test' has failed to address the issue of MIE abuse because the law has dictated the technology, whereas the technology was no longer similar to what the law said.

Judgements in competition law focuses more on the current problems rather than the 'future problems' as a sector-specific regulation does. Competition rules by general provisions could be more flexible than sector-specific regulation. As a case is widely discussed, its outcome might compromise many more different opinions than a sector-specific regulation. Competition rules stemming from case law also have an advantage of judicial independence. In addition, sector-specific regulations can be influenced by the lobbying effort of interest groups, especially when lobbying is recognised as an official method to make law.¹¹⁴ Sector-specific regulation could likewise foster discontent from the mis-regulated firms. Over a long time, the costs of mistakes in governance, lack of information, lack of awareness in technological development, bias and heuristics could be larger than the costs of litigation under competition law. Without a

¹¹⁴ Admittedly, lobby can influence even a competition regulation adopted by the Commission, but this document is subject to judicial review before the ECJ, minimising this side effect.

comparative analysis, one cannot say whose costs are more parsimonious. Finally, had the governments now built a sector-specific regulation for software infrastructures, they would have to start everything from scratch. On the contrary, if the rules are underpinned by pre-existing competition law, experience gained from precedents could save trial-and-error expenditure.

CONCLUSION

The main theme in this chapter is that although each of the economic and legal measures have represented many valid points, as a whole they have not given an adequate response to the issue of MIE abuse. Nevertheless, as argued in section 2.4, it does not mean that we need a new set of regulations. Instead, by looking back at the current measures and arguments, drawing the common thread amongst them and seeing what could be acceptable, the inadequate factors in each measure could be amended, so that they become more adaptive to our problem.

The ‘new economy’ argument in section 2.1 is applicable only where the number of realistic ‘youngsters’ is larger than the number of the ‘oldsters’; and the demands of these two types of consumers are different. Otherwise, ‘new economy’ has failed to answer the problem of MIE abuse because it has required great faith in the automatic transfer of welfare from natural monopolists to consumers, and it has undermined the network externalities and the constraints in consumer demand. Nevertheless, the ‘new economy’ arguments have raised two legitimate concerns: sunk costs and free riding. In Chapter 5, we will discuss how to remedy these risks.

As presented in section 2.2, copyright arguments, namely the idea/expression dichotomy and the exemption for reverse engineering have failed to solve the problem of MIE abuse. They have focused upon ambiguous concepts and technical matters, rather than the cores of abusive conduct, which are the software’s multi-layered structures and the leverage of market power (see section 1.5.2).

(1) The idea/expression dichotomy is unfit to solve the issue of ‘functionality,’ because the relationship between what is ‘functional’ and what is an idea is weak. Moreover, as seen in

section 2.2.1, the court's treatment of functional elements has not been similar among different countries. Using the vague concept of idea/expression dichotomy to find a consistent solution is confusing and risky.

- (2) Exceptions to copyright for reverse engineering although plausible in theory, has fallen short in practice. In addition, such an exemption do not take into account the incumbent's R&D sunk costs, because reverse engineer are legal even if the incumbent had not yet recovered these costs in the technology that has been reverse engineered.

Regarding competition law measures, the challenge of EFD in section 2.3 was how to apply it in the product markets that are protected by intellectual property rights. Even when the court has applied the EFD successfully to grant MIE access, it would face difficulty in defining a fair access price. The critiques of the US Supreme Court in *Verizon*, or those of AG Jacobs, Goyder and Larouche in Europe, should be taken into account. Firstly, in the software sector, the risks of sunk costs' non-recovery or free riding could be too high to justify the EFD application. Secondly, in order to apply the EFD, it is necessary to calculate the consumer benefit associated with the application to see whether the benefit is worth the costs raised in the first point. Thirdly, the EFD is too abstract to apply. Courts should produce a specific checklist of issues instead of applying a vague concept, such as 'exceptional circumstances'. These are the targets in Chapters 3, 4 and 5. A reform to the current EFD should be in a direction, which (1) increases consumer benefit, (2) reduces the ancillary costs for the incumbent and the authorities in the EFD application, and (3) reduce the abstract principles to more specific day to day situations (see OECD, 2001a: 193).

In reference to the argument in section 2.4 that a sector-specific regulation should govern the MIE in the software sector, we have argued that a sector-specific regulation is unsuitable to MIE governance at this moment, where software standards are still flexible and evolving. However, when the software infrastructures are clearly defined and stable, a 'hard and fast' sector-specific regulation can replace lengthy competition litigations. The sector-specific regulation at this stage not only protects competition but also *creates* competition (OECD,

1999: 164). To reach that stage, Goyder (2003: 522-23) remarks that a sector-specific regulation should be based on well-defined competition principles, not subjective policies. If the consistency in legal development is kept, once a sector-specific regulation is introduced, a compliance with this regulation should be considered as a compliance with antitrust principles (*lex specialis derogat legi generali*). Justice Scalia in *Verizon* [2004] 02-682 also held: “just as [sector-specific regulation] preserves claims that satisfy ... antitrust standards, it does not result in new claims that go beyond existing antitrust standards.”

Throughout this chapter, consumer interests come out as the paramount concern of both the incumbent and the entrants. This is expectable. As consumers pay the ultimate bill for all other stakeholders, regulatory policy should give them a fair share of benefits. However, the common shortcoming is the lack of a focus on consumer welfare. Instead, in the spotlight is protection of innovation and competition. These factors relate with the consumer interests, but they are not the sole factors. As will be argued in the next chapters, consumer demand, expected utility, consumer payoff and its probability, barriers to exit and switching costs are also the relevant factors. Considering these, the picture on consumer benefits versus the costs of anti-competitive conduct should become clearer.

CHAPTER III: SWITCHING COSTS AND DETRIMENT TO CONSUMERS IN NON-INNOVATIVE MARKETS

This chapter argues that a dominant incumbent abuses market power if its conduct prejudices consumer welfare without justification. This is when consumer detriment is higher than consumer benefit out of the incumbent's conduct (see Figure 1 at the Introduction). This argument is not new. Under Article 82(b) EC, limitation of markets 'to the prejudice of consumers' may become an abuse of dominant position. However, it is not easy to determine detriment to consumers. Therefore, in this chapter we will focus on a simple model: detriment to consumers in a non-innovative market, where the demand for innovative products is low. When our model for this simple case is robust, it will constitute the fundamental for the next chapter: detriment to consumers in an innovative market.

3.1 CONSUMER WELFARE AND ABUSIVE CONDUCT**3.1.1 THE OBJECTIVES OF CONSUMER WELFARE ANALYSIS IN COMPETITION LAW**

The rationale of consumer welfare as a difference between the benefits and the detriments to consumers is introduced in section 1.1.2. To analyse consumer welfare, I will follow the three steps in Figure 3 above by asking three questions:

- (1) Does the alleged conduct bring detriment to the consumers?¹¹⁵ To answer this question, two sub-questions should be asked: who are the consumers, and what is detriment to consumers? They will be analysed in the next sections 3.1.2 and 3.2.
- (2) If consumer detriment is confirmed, is the effect of such conduct justifiable in order to bring about some benefit, either directly (in terms of money gain) or indirectly (in terms of saving costs) to the consumers?¹¹⁶ To answer this question, we need to consider the probability that a consumer benefit can offset the consumer detriment. My argument is that the only two feasible justifications vis-à-vis consumer detriments are the sunk costs and the free riding concerns.
- (3) When the scope of justifications in question (2) above is reduced to the most relevant ones, the third question is: will consumer benefit exceed consumer detriment, if not in the short run, then in the long run? Toward the end of Chapter 5, we will analyse the methods to remedy the risk of sunk costs non-recovery and free riding, at the same time minimise the detriment to consumers. This approach aims at enhancing consumer welfare.

Looking at the above three questions step-by-step, we then obtain a procedural rule: the applicant for Article 82 EC sanction must prove that consumers have suffered detriment or will do so, because of the incumbent's conduct. When such proof is furnished, the burden is shifted to the incumbent. He must prove that his conduct is justifiable and in the end will bring more benefits to consumers than it harms them. The court, as a 'humble student' rather than a 'know-

¹¹⁵ Consumer detriment should be the starting point of analysing alleged conduct. In *Kodak*, Justice Blackmun said: "we need not decide whether Kodak's behaviour has any pro-competitive effects... . We note only that Kodak's [conduct] is simply not one that appears always or almost always to enhance competition... . We [then] weigh the risk of deterring pro-competitive behaviour ... against the risk that illegal behaviour go unpunished." (para. 43). Similarly, my argument is that consumer detriment is a presumption of negative effect to consumer welfare.

¹¹⁶ In *Saint Gobain/Wacker-Chemie/NOM* OJ [1997] L 247/1, paras. 244-46, the Commission ruled that for an exemption of competition rule on the grounds of efficiency to be justified, the incumbent must show that such efficiency will arise and it will be passed on to the consumers. If there is no such cost-benefit causal relationship, a cost unnecessarily incurred is still a detriment to consumers.

it-all’ mandarin, will learn from both sides, weigh the evidence, analyse costs and benefits before making a decision. If the court makes a wrong decision in the first case, it will correct in the second case, without changing the procedural rule or inventing another doctrine. As long as it follows a right procedure, the just outcome would arise. However, if the court adopts a rigid substantive rule, it will likely to come to a decision unfit with the fact of the case. A logical and transparent procedure would help to support a just substantive outcome. Nevertheless, procedural rule in itself does not suffice to replace substantive standards of proof. Chapters 3, 4 and 5 will deal with substantive standards of proof with regard to the MIE exclusive control. A procedural rule is only proposed in section 5.5 to make the previous substantive proposals workable.

3.1.2 THE DEFINITION OF CONSUMER IN ARTICLE 82 EC

Consumers present the demand side of the market, as opposed to the suppliers who present the supply side (see Figure 5 above). If the purpose of competition law is to protect consumer welfare, we have to identify whose welfare is affected by alleged conduct. A principle set forth in *United Brand* [1978] ECR: 217 is that one has to define the relevant consumers before he can define the market, because different consumers may have different views about product substitutability. In a US counterpart, *Kodak* [1992] 504 US 451: 14, justice Blackmun also held that to define a market, one needs to identify the consumers (para. 14). In addition, consumers should be defined to give a meaning for Article 82(b) EC (“limiting production, markets or technical development to the prejudice of *consumers*”).

In conventional meaning, the term ‘consumers’ means the people who purchase the product for the purpose of usage *outside their trade or profession*.¹¹⁷ However, if we apply this definition to competition law, many markets would not have consumers, such as the market for raw materials (*Commercial Solvents*, see section 1.5.2) or databases (*IMS*, see section 1.5.3). Therefore, the goal of consumer welfare, or the requirement that the consumer will receive a

¹¹⁷ See *Brussels Convention on Jurisdiction and Enforcement of Judgement*, quoted by Stuyck (2000: 376).

'fair share' under Article 81(3) EC would become meaningless. Whish (2001: 129) argues that for the purpose of competition law, 'consumers' do not necessarily mean 'end users' or those who purchase products for the purpose of consumption. Purchasers in the course of trading are also qualified as consumers. The Commission has recently considered this issue. At para. 73 of the *Draft Guidelines on the Application of Article 81(3) EC* it states: "the concept of 'consumers' encompasses all users of the products covered by the agreement, including wholesalers, retailers and final consumers. In other words, consumers within the meaning of Article 81(3) are the customers of the parties to the agreement and subsequent purchasers."

According to Goyder (2003: 324-37), there is a close relationship between Articles 81 and 82 EC. The interests they protect and the effects of the anticompetitive practices, which they are concerned, are similar. Therefore, using the definition of consumers under Article 81 to the context of Article 82 is acceptable. This treatment can also be deduced from two paragraphs of *Market Notice*: 15 (substitutability from the consumers' viewpoint) and 17 (the application of SSNIP test to customers).

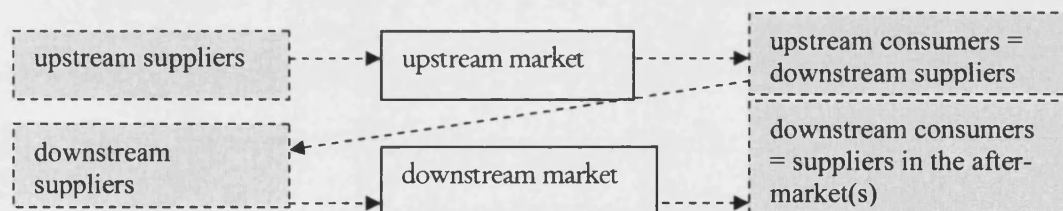


Figure 13: consumers in different markets

The definition: "consumers are the relevant customers of the incumbent and subsequent purchasers" becomes difficult to implement if different markets are involved, as seen in the Figure 13 above. Final consumers may be much further down the line of the production chain to be seen. Hence, the definition of consumers should be contextual and the question which then emerges is "consumers in which market?" In *Brasserie de Haecht v Wilkin* [1967] ECR 407: 415, the ECJ held: "it would be pointless to consider ... a practice by reason of its effect if those effects were distinct from the market in which they are seen to operate." For that purpose, the scope of consumers in a relevant market should be narrowed to those who have comparable

demands (*Market Notice*: para. 41-43, *Media Market, Economics*: § 3.4.55). When putting the MIEs into context, the ‘comparable demand’ test would result in the following.

If there is only one market controlled by the MIE, consumers are the customers of the incumbent’s product (see Figure 13 above). For example, in the market for pharmaceutical databases (*IMS*, section 1.5.3.b above), the consumers are the pharmaceutical companies, not the drug users, because the latter are not dependent on the IMS data format. We do not take into account downstream consumers. From the economic perspective, when all consumers in the upstream market suffer the same detriment, they will likely pass it on to the consumers in the downstream market. As business entities, they have to recover their loss. Alternatively, the upstream customers could have provided more benefits to the consumers in the downstream markets, if they had not suffered such detriment. At any rate, a detriment suffered by the upstream customers will have a negative impact on the downstream customers.

If the scope of control of the MIE is extended to the downstream market; the scope of consumers will also include the customers of the downstream suppliers. However, these downstream customers will constitute a downstream market, separated from the upstream market of the upstream consumers, because for customers to belong to the same market, they should not have a conflict of interests.¹¹⁸

Please note that a person can be the consumer of several markets; and he may receive benefit in one but suffer detriment in another. As shown in Figure 14, to play digital media, a PC user can use Windows Media Player (WMP) in his PC and RealOne in his mobile phone. A

¹¹⁸ *Market Notice* asserts: “a distinct group of customers for the relevant product may constitute a narrower, distinct market ... This will usually be the case when two conditions are met: (a) it is possible to identify clearly which group a customer belongs to ..., and (b) trade among customers or arbitrage by third parties *should not be feasible*.” (Para. 43). For example, in the market for media players, consumers include both the content providers (e.g., film makers, who ‘rip’ their movies with the media players’ format), and the content users (e.g., the PC users, who watch the movies). Both types of users use the same product - a media player. However, they have conflict of interests (the film makers sell their movies to the film users), therefore cannot belong to the same market, although they may suffer the same detriment from the incumbent. When ascertaining detriment to consumers, we need to take into account the losses of both types of consumers, and the anticompetitive effect in both markets.

network effects in WMP may bring more benefit for his PC, but less benefit for his mobile phone. As such, the concept of detriment must be subject-specific and market-specific.

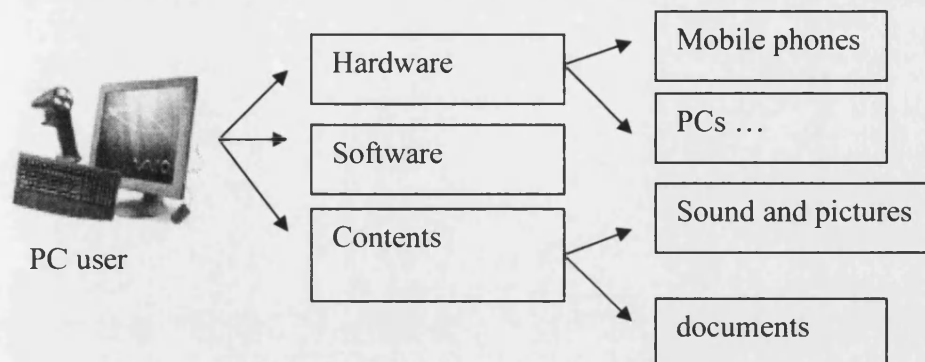


Figure 14: one consumer in many markets

IMS is a good example of how different definitions of consumers lead to different results (see section 1.5.3.b above). Considering consumers as the *IMS*'s customers, the Commission had surveyed 110 German pharmaceutical companies. The result has shown that the harm caused by *IMS* to its customers is remarkable (Decision No. 2002/165/EC, para. 119). However, the CFI did not agree with this approach. The Court held (T-148/01: 145):

“As the cost to pharmaceutical companies of purchasing sales-data information forms a small proportion of their overall sales and marketing expenditure, there would be no effect on final consumers of pharmaceutical products if exclusive right were maintained.”

The CFI has made a mistake by concluding that consumers were the patients and not the pharmaceutical companies. Patients will be subject to a different product market (the drug market) and geographical market (each country has a different health care system and drug pricing regulation). The problem for the patients is the market power of the pharmaceutical companies rather than the abuse from *IMS*. This topic is very different from the discussion topic, namely an abuse in the market for regional data services.

Hence, to ascertain abusive conduct relating to an MIE, the concept of consumer includes not only the individual but also the corporate customers of the MIE-related products. If consumers have conflict of interests, they do not belong to the same market.

3.2 ABUSE AND DETRIMENT TO CONSUMERS

3.2.1 ABUSE OF PROPERTY RIGHTS AND ABUSE OF COPYRIGHT

There can be many definitions of ‘abuse’ on the grounds of public law (competition). OECD (1999a: 173) stated:

“The definition of what is abusive, or at least what is illegal, should depend on the objective of the law. If economic efficiency is the objective, then welfare-reducing actions should be considered abusive. If, alternatively, fair trading is the objective then, e.g., taking advantage of a better bargaining position may be considered abusive. Other objectives – pluralism, promotion of small business, etc. – would each imply a set of actions that hamper their achievement and therefore that would be abusive given that objective.”

As noted in section 1.1.1, the concept of copyright is similar to property rights, and therefore copyright limitations should be narrowed to exceptional cases.¹¹⁹ Given these varieties of objectives, and that a private law (copyright law) also has its own, sometimes contradictory, objectives, can a court discreetly limit property rights because the rightholder has exercised his rights contrary to the expectation of a public law? Why should the incumbent limit his property rights for the sake of unknown consumers? Is using competition law to limit copyright a violation of human rights?¹²⁰ The concept ‘abuse of dominant position’ would be more legitimised if it has a link with the concept ‘abuse of [private] right’ (in French *abus de droit*), Only when there is a consistency between these two concepts can a limitation of

¹¹⁹ Following the Roman law’s principle *servitutibus civiliter utendum est*, Wolodkiewicz and Zablocka (1996: 121). See also Whish (2001: 46). A similar principle applies in US antitrust law (*IP Guidelines, Sec. 2.1*). In *Aspen Highlands Skiing Corp. v Aspen Skiing Co.* [1982] 472 US: 611, the Supreme Court held: “a firm possessing market power has no duty to co-operate with its business rivals, unless the purpose is predatory or anticompetitive.”

¹²⁰ Article 27(2) of *Universal Declaration of Human Rights*: “everyone has the right to protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author.”

copyright convince the right holders. Therefore, we need to know what an abuse of copyright is, from copyright's perspective.¹²¹

a. Abuse of copyright

Although the definition of 'abuse' of copyright is not established, we can make an analogy from the definition of abuse of property right. Some authors criticise this analogy. AG Gulman in the *Magill* Opinion remarks: "intellectual property rights can be exercised even if that leads to ... restriction of competition" (para. 80). Nevertheless, 'greater' protection does not mean immunity from being held accountable for abuse of rights. At para. 48 of the *Magill* judgement, the ECJ held: "the [incumbent has] wrongly presupposed that where [its] conduct ... consists of the exercise of ... 'copyright', such conduct can never be reviewed [under competition law]." By the same token, the Court of Appeal for the District of Columbia has rejected Microsoft's argument that "if intellectual property rights have been lawfully acquired, their subsequent exercise cannot give rise to [an abuse]." In *Microsoft Appeal: 22* the Court states: "[Microsoft's argument] is no more correct than the proposition that use of one's personal property, such as a baseball bat, cannot give rise to tort liability."

b. Abuse as a quasi-delictual concept

Common law countries do not have the concept of abuse of rights, although they have an equitable doctrine of *misuse* to protect the weaker party in litigation. In an attempt to clearly define the concept of copyright misuse, Lord Hoffman in *Canon v Green Cartridge* [1997] FSR 819 held that consumers were misused when it was "plain and obvious that it was unfair to

¹²¹ OECD (2001a): 193. Section 2.1 of the *IP Guidelines* also states that intellectual property requires no greater and no less anti-trust scrutiny than any other kind of property. From the jurisprudence's perspective, Paton (1972: 475) said that abuse of rights sets the limit of private interest: "most systems of law have curbed to some extent the abuses of exaggerated individualism. ... Ultimately, the dispute concerning abuse of rights is a conflict between the individualist view ... and the collectivist view that would examine the exercise of rights from the angle of the community of a whole."

[them].” This definition however is too vague to be useful.¹²² In civil law countries, Guibault (2002: 186) notes that the concept *abus de droit* bears two meanings. The first interpretation comes from Josserand (1939: 396), in which abuse is a failure to achieve the social function of a private right.¹²³ The second interpretation originates from Dabbing (1952: 293); and Ghestin and Goubeaux (1990: 694), who associate *abus de droit* with tortious conduct (*quasi-delit*), which is an intentional exercise of a private right to prejudice others. Booyser (2003: 299) and Le (1999: 66-67) also support this interpretation, according to them *abus de droit* in general is an unjustifiable exercise of the rights of a person that creates detriment to another person.

The first approach, saying that an exercise of copyright is abusive when it does not coincide with the social function of intellectual property, is too vague to be workable. To start with, there is no legal requirement that a rightholder must exercise his rights according to their functions. A particular use of copyright could serve many purposes. Moreover, this interpretation could run the risk of being arbitrary in deciding whether a particular use of copyright serves its function. Josserand (1939) divides rights from a jurisprudential viewpoint into absolute private rights, relative rights and altruistic rights. According to him, the second and the third categories can only be exercised in so far as they serve legitimate functions that a right was designed for. This taxonomy seems to be moral but is in fact arbitrary. Paton (1972: 474) said: “to carry the doctrine [of Josserand] to its logical end we should have to dethrone the individualist theory of rights and use as a test of the measure by which that particular exercise was useful to the community.” In practice, courts in both the US and the EU have tried hard to decide what the function of a refusal to license would be and judge whether the refusal is

¹²² Misuse in an equity concept, based on the doctrine of “*unclean hand*.” That is, those who defrauded the opposing party will not be heard to assert their own rights in equity. This doctrine was used recently in *Atari v Nintendo*. 975 F.2d 932 (9th Cir. 1992). Atari challenged the restrictive clauses in Nintendo software copyright licensing under the doctrine of misuse, but because Atari itself has accessed Nintendo’s secret through fraud (unclean hand), the Ninth Circuit refused to uphold the misuse doctrine.

¹²³ From a jurisprudential viewpoint, Paton (1972: 475) also observes that even a refusal to enter into a contract may lead to responsibility, if the law disapproves of the motive.

legitimate or abusive without satisfactory answer.¹²⁴ Without looking at the effect of the refusal, it is difficult to judge whether the rightholder has properly exercised his copyright.

Govaere's postulation (1996) that copyright is 'abusively granted' because it does not serve its functions is also unusual. In contrast to patents, the grant of a copyright is automatic; therefore, the argument that copyright is abusively granted may confuse who abuses whom. The issue as to whether an object is protected by intellectual property is a matter of law. If a property right is 'abusively granted,' then the law, not the rightholder, is to blame.

What is more useful for consumers perhaps is to look at the effect of a use rather than its motivation. This leads us to the second interpretation of *abus de droit*, in which the core of abuse is in detriment to consumers, not in the function of the use. To explain this one may refer to the Dutch New Civil Code (NBW):¹²⁵

- Article 3:13(1): "the holder of a right may not exercise it to the extent that it is abused."
- Article 3:13(2): "the holder of a right must take into account any disproportion that may exist between the interest to exercise the right and the harm caused thereby."

As such, the nature of *abus de droit* is quasi-delictual, and consequently the law should establish a relevant duty of care. In many civil law countries, there is a duty of care not to exercise a private right to the extent that it harms the property rights of others (French Civil

¹²⁴ In *Rural Telephone Service Co. v Feist Publication* [1992] 957 F.2d 765: 768-69, the US Supreme Court stated that one needs to determine "whether the refusal to deal is ... to foreclose competition, to gain a competitive advantage, or to destroy competition." Similarly, in *Ladbroke* [1997] ECR II-923, the ECJ held that if a result of the refusal is to give the copyright owner some advantage in the derivative market "which goes beyond the proper protection of 'essential function' of copyright" without justification, the refusal is abusive. Ulrich (in Zach 2000: 288) also notes that information is multipurpose goods, which may have more functions than what copyright used to protect.

¹²⁵ See also BGB, Art. 226: "the exercise of a right is forbidden, if it can have no other purpose than harm some other person." Swiss Civil Code, Art. 2: "the law does not protect the manifest abuse of a right." Chinese Taiwan Code also states: "a right cannot be exercised for the main purpose of causing injury to other" (quoted by Paton 1972: 474).

Code, Art. 544, Dutch Civil Code (NBW), Art. 3:13, German Civil Code (BGB), §§ 226 and 242, see Guibault, 2002: 186; Vietnamese Civil Code, Arts. 288 and 395, see Le, 1999: 42, 114). There has been no such similar provision in English law, but the law is flexible enough to accept this principle. Lord Nicholls in *Royal Bank of Scotland v Etridge* [2002] 2 AC 773 also held that when unfair coercion exists, the weaker party suffers, as he cannot make a free and independent choice.

c. Volenti non fit injuria?

Given that the incumbent has a duty not to harm the consumers, one may ask: why should the law not impose a ‘consumer beware’ principle (*caveat emptor*)? If this principle were to be followed, the consumers would have been more careful before buying a product. If the consumers are the ones who have chosen the incumbent’s product from their initial freedom of choice, they should not blame the incumbent for being locked in, following the principle *volenti non fit injuria* (Cooter and Ulen, 1996: 262). To this argument, please note that the principle *volenti* cannot operate against the consumers whose initial choice has been already constrained (see section 1.5.3 above). Cane (1997: 42, 60-61) notes that although ‘*volenti*’ means ‘consent,’ but consent would be meaningless if the prejudiced party has no choice. The US Supreme Court also held in *Standard Oil v United States* (1910) 221 US 1 that: “freedom to contract must be [based on] the freedom from undue restraint of trade.” As argued in sections 1.3.3, 1.4.2 and 1.5.3, if network effects are strong, consumer choices are limited. At least in regards to package software, the programs unaffected by network effects or infrastructural interfaces are rare (see e.g., CCIA, 2003b: 4, and Vickers, 2003: 14). Therefore, the *volenti non fit injuria* principle should not be applicable.

In order to define the boundary of the duty of care, we can refer to the Hand Rule, the most celebrated formulation in US tort law (Owen, 2004: 13). This rule is developed by Justice Learned Hand in *US v Carroll Towing* [1947] 159 F.2d 169: *the law should impose a duty of care on the party that could avoid the risks for the other party at a lower cost*. This is a cost-benefit analysis aiming at a solution that enhances social welfare. Judge Learned Hand reasoned

that ascertaining an appropriate level of duty of care is a function of three factors: the detriment (or loss, L), the burden of taking precaution to avoid a risk of loss (B) and the probability of the loss (p). A duty of care is implied if $B < pL$, i.e., the cost to avoid the loss (B) is smaller than the expected cost when the loss occurs (pL).¹²⁶ In a plain meaning, there is a duty to avoid a risk of loss when there is a high probability that if such a duty is carried out, the risk of detriment would have been reduced.

3.2.2 THE CONCEPT OF DETRIMENT TO CONSUMERS

The Hand Rule $B < pL$ grounds the duty of care, but it does not suggest how to identify its variables, among them L , or detriment to consumers in our context. According to Shavell (2004: 595-96), issues in welfare economics, including consumer detriment, should start from the concept of utility, i.e., anything that raises a person's well-being.¹²⁷ Here I postulate that a detriment is a loss of utility to consumers. Assume that there are two products: 1 and 2, having utility U_1 and U_2 , respectively. Given that $U_1 < U_2$, consumers are rational and self-interested, and the information is complete, then the consumers would switch from product 1 to product 2 in order to maximise their utility. The difference $\Delta U = U_2 - U_1$ represents the utility surplus or the consumer demand. If such a demand is not satisfied, the consumers will suffer a loss of the utility surplus that they would otherwise have gained. The amount $-\Delta U = U_1 - U_2 < 0$ is the expected utility deficit, which represents detriment to consumers. Whish (2001: 112-13), Grosheide (2001: 321) and Anderman (2002: 14) also postulate that the loss of utility includes not only a direct but also an indirect loss, i.e., the loss of an opportunity to gain utility surplus.

¹²⁶ Shavell (2004: 577) describes this logic as follows: if a constructor think that it is more effective to let the loss occur and pay damages than to prevent hazardous objects fall off from the construction site, he would not bother to build fences around. Cooter and Ulen (2000: 316) also note that the incumbent is under a duty of care not to use his power to cause damages to the consumers if he can control the negative externalities against the former.

¹²⁷ In *Ethics*, Aristotle perceived the value of utility as follows: "success is not merited by power or wealth, unless we can make good use (i.e., utility) of them while living." (Quoted in Barnes, ed. 1995: 199).

One can argue that utility cannot represent consumer interests, as each consumer may have different interests. I do not dispute that. However, the purpose of utility calculation is to clarify understanding, not to quantify an exact interest (Shavell, 2004: 662, 663). If we replace utility (U) with any magnitude that represent what an individual attributes to a product, we will receive a similar result. That is: if the consumer cannot receive what he thinks is better than what he is having, he suffers detriment, regardless of what other thinks is 'good' for him.

Detriment from disutility is an observable fact among corporate users. The studies of Powell, Well and Broadbent show that some sectors, such as airline reservation systems, libraries or hospital supply industries have been slow in adapting new technology and changing the IT infrastructure; although new technology exists.¹²⁸ The surveys of Boehm (1989) in the US and Ropponen (1999: 250-53) in Finland also show that firms may miss an opportunity to change software because their information content is formatted in an exclusive interface that they do not control. Consequently, they have acted in an anti-innovative way: studying the current requirements of the current standards and investing in these standards. This strategy has given a credit to the incumbent software supplier and has encouraged the opportunistic conduct of the incumbent (see Willcocks, Fitzgerald and Lacity, 1999: 325-26).

Should utility surplus deficit be taken as a parameter of consumer detriment? Some disagree. AG Tizzano (*IMS*, C-418/01, opinion dated 2 October 2003, para. 62) takes the position that consumer dissatisfaction, not the loss of utility surplus, is the standard to judge detriment to consumers. If the consumers have been dissatisfied, but they had not complained, then one cannot say that the situation was detrimental to them (see e.g., Zauberman, 2000). The shortcoming of this argument is that it does not see the difference between a satisfaction of consumers when they have no choice, and a satisfaction when they have ones. The lack of

¹²⁸ Powell (1999: 153). Well and Broadbent (1999: 348) note that firms are cost-sensitive in IT investment (so-called "utility view of IT infrastructure"). They would consider the costs of changing (including switching costs) as a major obstacle to IT investment. As they are price-elastic, they have a large stake in maintaining compatibility between the old and the new systems, so that they may save switching costs. Shapiro and Varian (1999) also note that large banks or corporations have their mainframe computers locked in into IBM's MVS and VSE operating systems, and services are tied into Computer Associates.

information can create a bounded satisfaction. People make judgement on what they knew, not on what they should have known. Nobel laureate economist Herbert Simon (1964) demonstrates that consumers are not strictly rational but ‘bound rational’. Consumers’ demand will depend on the availability of choices that have come to the consumers’ knowledge and the stage of technological development (see e.g., Pindyck and Rubinfeld, 2001: 79). Moreover, consumer satisfaction is not a static concept. It can change with time. When a market is liberalised and more choices are available, the ‘satisfaction’ with the incumbent’s product will reduce. As such, the term ‘satisfaction’ should be the satisfaction given a specific set of information, and a specific set of choices.

The postulation that detriment is a deficit of utility surplus is confirmed in many cases, both in Europe and in the US. In *Magill* [1995] ECR I-743 (para. 52), the ECJ held that consumers can be prejudiced where they have a ‘specific, constant and regular’ potential demand for a new (i.e., higher utility) product, but this demand is not satisfied by the incumbent without justification. Likewise, in *Kodak v Technical Image Services* [1992] 504 US 451 (para. 50) and *Mars v Teknowledge* [2000] FSR 138, consumers had suffered detriment as they were forced to repair their equipment at the incumbent’s service points at higher prices than at other independent service organisations. However, when a market is dynamic and innovative, it is difficult to ascertain which product will bring more benefit to consumers in the long run. Aware of this shortcoming, –my analysis starts with a simple case scenario -- non-innovative markets.

3.2.3 NON-INNOVATIVE MARKETS INVOLVING INTELLECTUAL PROPERTY RIGHTS

My argument is that when a market is non-innovative, a dominant position may give rise to an abuse, if such a position causes consumer detriment and prevents competition on the merits taking place. If the market is innovative, a dominant position must be combined with active anticompetitive conduct [before it ?] [and they] will give rise to an abuse. This assessment does not address certain product markets such as telecommunication. These markets are innovative, but the Commission needs not wait for anticompetitive conduct to take place in order to

intervene. The mandate of intervention stems from Article 86 EC, not Article 82 EC (see section 2.4 above).

Many authors, for example John Temple Lang (2002: 30), assume that the consumers always demand new and innovative products. This assumption is not always true. Pindyck and Rubinfeld (2001: 75) and Cooter and Ulen (2000: 24) show that different consumers have different views on utilities and only they can define their own demand. By simply assuming that the consumers always demand new products (even at a high price), a large number of consumers with low budgets can be excluded. Moreover, due to this 'innovation defence', an incumbent could allege that it needs intellectual property protection in order to 'innovate' simple works, such as television programs (see *Magill*, in sections 1.1.3 and 6.2.3). On the other hand, suppose that the consumers do not only demand 'cheap' products but also innovative products, entrants could use the pretext of 'meeting the consumer demand' to free ride the incumbent's innovative fruits.

Hence, it is necessary to define the border between an innovative market and a non-innovative one, based on facts, rather than on the existence of intellectual property law. For this purpose, I define 'innovation' as technical progress that meets consumer demand, i.e., enhances consumer surplus. Consequently, the ECJ's request in *Magill* that an entrant must prove a demand for a new/innovative product would be absurd if there were no demand for technical progress in the making of television program. For such an innovation to emerge, competition authorities should look at the market to see what the consumer's demands are: new products or cheaper products. In many cases, the answer is "both"; but in some cases, the answer is that "we only want the same product at a lower price." In these cases, the markets are no longer innovative, although in the other levels of production innovation might have been taken place. When that is the case, competition is on price rather on innovation (Viscusi *et al.*, 2001: 583).

A number of markets could be qualified as non-innovative even when they involve intellectual property rights. In *Tetra Pak I* [1990] ECR II-309, the CFI has rejected Tetrapak's argument that the market for milk filling machinery is an innovative one, although the machine

is patented. The reason is that according to the surveys among dairies in the market, the demand for innovation was slow. Dairies had not changed their machines in 10 years, and milk had not been a growing market (see e.g., Goyder, 2003: 311). Innovation is also not demanded in some markets for services (*Kodak* and *Hugin*) although they involve intellectual property rights.¹²⁹ In *Magill*, a combined television guide was nothing ‘new’ in terms of intellectual property rights. This product has been a combination of obvious and simple ideas. By requiring a product to be ‘new’ whenever a case involved intellectual property rights (*Magill*, para. 52), the ECJ has created an impression that any market involving intellectual property rights is an innovative market. In *IMS Health v NDC* (Case C-418/01), IMS has used the *Magill* test to allege that to identify an abuse of the dominant position, the entrant must supply a new product. This argument was implicitly rejected by the ECJ in its latest judgement (*IMS C-418/01*, para. 47) when the Court defines ‘new’ simply as ‘non-duplicative’. In this situation, to request the entrants to provide an innovative product is absurd, because even the incumbent cannot fulfil this task. Consumers would not demand innovation if, as explained below, their demand in the market is constrained due to switching costs. Thus, this market may start as an innovative but end as a non-innovative one.

3.3 INDIRECT SWITCHING COSTS

There are several definitions of switching costs. According to Von Weizacker (1984: 1085) and Klemperer (1987: 137), switching costs are ‘the costs of changing suppliers’. Chen and Hitt (2001: 2) define switching costs as “any perceived disutility a customer would experience from switching supplier.” According to Shapiro and Varian (1998), “switching costs are the monetary equivalent of the inconvenience imposed on the user due to changing provider.”

¹²⁹ See *Hugin Kassaregister AB v Commission* [1979] ECR 1869. Hugin evokes its design rights to prevent Lipton, a service firm, from producing or acquiring Hugin’s spare parts from other producers. . For *Kodak v Image Technical Services* (1992) 504 U.S. 451, see section 6.3.1.

Their common point is that switching costs indicate stickiness in consumer choice.¹³⁰ *Market Guidelines* (para. 50) mentioned switching costs as a barrier to exit of the consumers:

“Consumers who have invested in technology or made any other necessary investments in order to receive a service or use a product may be unwilling to incur any additional costs involved in switching to an otherwise substitutable service or product [...]. Accordingly, in a situation where end users face significant switching costs in order to substitute product A for product B, these two products should not be included in the same relevant market.”

Switching costs can create a bias in consumer choice against a new and arguably better product. The choice of OS between Windows and Linux is an example. The study of Gartner Dataquest (2003) shows that when users switch from using Microsoft Windows to Linux, they must replace or rewrite many Windows applications. The study shows that, on the average, the utility surplus created by the Linux package compared to the Microsoft’s package constitutes only 20-30 percent of the total switching costs that the consumer must come across when they switch to the Linux package. The higher the number of Windows application programs, the higher the switching costs will be. The studies conclude that switching from Windows to Linux is profitable only for the users who have a narrow demand for applications, or for the users who are using the older versions of Windows (such as Windows 95), where the number of supported software programs on this platform is limited.¹³¹

3.3.1 DIRECT AND INDIRECT SWITCHING COSTS

Do switching costs create a positive or a negative effect on consumers? Academic opinions are still divided. Von Weizacker (1984) demonstrates that switching costs make consumers

¹³⁰ Apart from the prevailing definitions of switching costs as consumer costs, Porter (1980: 20) offers a different definition: “switching costs are the economic, strategic and emotional factors that keep the incumbent competing even though they may be earning low or even negative returns on investment.” OECD (2001: 3.1.3) provides a similar definition. However, as these costs relate to expenditure of the incumbent, they do not provide a source of abuse and therefore beyond the scope of our analysis.

¹³¹ Gartner Dataquest (2003) *Linux on the Desktop: The Whole Story*, report No. AV-2-6574, by Smith, Simpson, Silver and Fiering.

become more price-sensitive and eventually will accelerate competition, provided that no installed base has been established. Klemperer (1988) continues this theme by arguing that when switching costs have already burdened consumers, entry of the incumbent's rivals may create market confusion and decrease consumer welfare. Chen and Hitt (2001: 134-140) agree. They state that the entrants can decide to subsidise the youngsters by offering their product/service at a lower price if they consider switching costs. These costs therefore can promote consumer welfare.¹³² Farrell and Klemperer (2001: 3.2.2) also support this argument, using an example that artificial switching costs, such as a frequent flyer bonus, is efficient to consumers and prevents them from inefficient switching. On the other hand, Nilssen (1992: 583) demonstrates that when consumers are affected by switching costs, the incumbent may raise prices and harm the consumers.¹³³

Without a separation between switching costs and utility, one may not ascertain detriment to consumers. If utility is a part of switching costs, consumers can internalise these costs. Assuming consumers are self-interested, they would obviously seek to maximise their utility. Otherwise, switching costs are externalities. Particularly:

- (1) If switching costs are related to the utility of the current product (direct switching costs), they cannot become a detriment to consumers. Rather, they are the trade-off between using the current product and another product, i.e., opportunity costs.¹³⁴ If consumers decide to switch, they must forgo the utility they had enjoyed up to the switching point.
- (2) If the switching costs are incurred indirectly, such as the costs of forfeiting telephone numbers in section 2.1 above, these costs are unrelated to the utility of the current product.

¹³² Chen and Hitt conducted a study of the impact of brand loyalty in switching securities broker. They concluded that using reputation to increase switching costs for consumers could be an efficient practice.

¹³³ Nilssen (1992) "Two kinds of consumer switching costs" 23 *RAND J of Econ.* 4: 579-589.

¹³⁴ Opportunity cost is the loss of alternative gains (or utility) that a consumer might lose if he does not use a particular product (see Cooter and Ulen, 1996: 28; Whish, 2001: 159).

Opportunity costs are zero, because they are lost anyway without being compensated by an utility. These costs become 'sunk'.

Among the economic studies of switching costs, only Nilssen (1992: 580) notes the difference between switching costs and utility. He differentiates two types of switching costs: endogenous (direct) switching costs and exogenous (indirect) switching costs. Please note that it is possible for indirect switching costs to cause both detriment and benefit to the consumers, such as network effects. As discussed in sections 1.5.2 and 1.5.3, network control can result in harmful effects to consumers. On the contrary, section 2.1 postulates that network and standardisation may respond to consumer demand and therefore bring about consumer benefit. A public choice that enhances consumer welfare in this situation would be to remedy the negative impact without prejudicing the positive impact of the network effects..

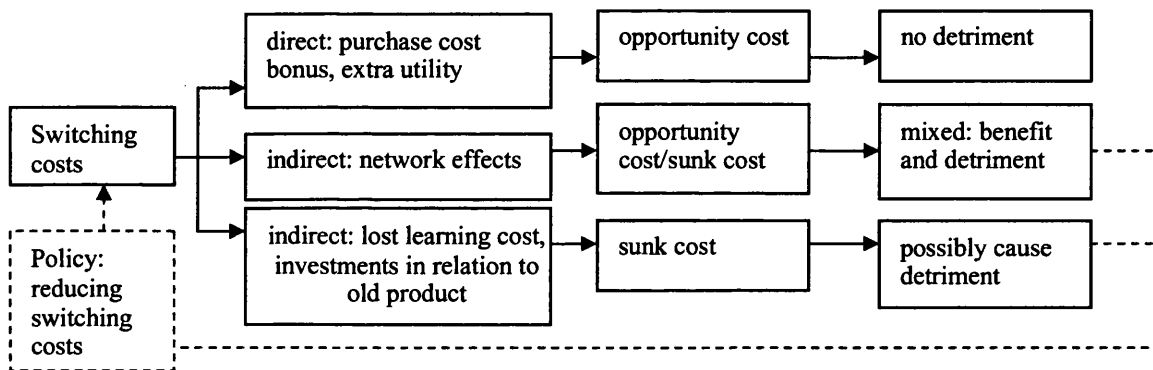


Figure 15: switching costs and the possibility of consumer detriment

As our aim is to address the detriment to consumers indirect switching costs will be in the spotlight. From now on, the term 'switching costs' will indicate 'indirect switching costs' unless otherwise defined.

3.3.2 CLASSIFICATIONS OF INDIRECT SWITCHING COSTS

The steps that consumers must take in order to switch from one product to another are (1) terminating their relationship with the incumbent, and (2) learning to adapt to the new environment. Based on this assumption, von Weizacker (1984) lists three types of switching

costs (S), namely transaction costs (T), learning costs (L) and artificial/contract costs (A).¹³⁵ The last category includes the direct switching costs mentioned in section 3.3.1. If we take only indirect switching costs into account, “ A ” can be excluded, so $S = T + L$ (Nilssen, 1992: 580). $Min S = Min T + Min L$. The two focal components of transaction costs in this thesis will be the consumers’ expenditure in relation to the incumbent’s product and network effects.

a. Consumer’s expenditure as indirect switching costs

Putting the multi-layered structure of the information technology (hardware-code-content, see section 1.1.2) into context, the content invested in relation to the old code layer can become switching costs, to the extent that it is not reusable with the new code. An example is the investments of the PC users in the applications of Microsoft and the files formatted in these applications. The potential loss of these investments would prevent the users from switching from Microsoft networks to rival networks such as Linux (see Gartner Dataquest, in section 2.1). Para. 42 of the *Market Notice* provides the following non-exhaustive list of indirect switching costs:

“It is not possible to provide an exhaustive list of all the possible barriers to substitution and of switching costs... These barriers ... might have a wide range of origins, ... [such as] constraints arising in downstream markets, ... or loss in current output in order to switch to alternative inputs, ... specific investment in production process, learning and human capital investment, retooling costs or other investments, and others.”

As consumers keep generating new contents, switching costs grow and affect his capacity to buy a better product. This dilemma can be described in the Shubik’s dollar auction game (see Poundstone, 1992: 261). In this game, many bidders join a bid for a \$10 note. Whoever bids the highest receives the money, minus the bid. The second highest bidder must pay his bid

¹³⁵ Different from Weizacker, Burnham (1998) divides switching costs into procedural, financial and relational switching costs. However, no other study has employed this taxonomy. Burnham merely pointed out that procedural or relational switching costs can make oldsters stay with the incumbent even when entrants offer financial switching incentives.

price, but will not receive any money. When the bid reaches \$10, the bidders must decide whether to stop, or to bid higher than \$10 in order to avoid being the runner up. Experiment shows that they usually continue bidding to avoid being the runner up. The rule 'runner up has to pay the bid price' constitutes a switching cost for the bidders, if they change strategy. This game shows that the higher the consumers' investment, the higher the switching costs, and the larger the potential detriment to consumers. An intentional rise of switching costs by system incompatibility would amount to an abuse.¹³⁶

One may argue that switching costs are recoverable, because the oldsters can resell the old product or its content. However, a software user cannot resell its old software to another user, as he is a licensee, not a software owner.¹³⁷ In the absence of a secondary market, the negative impact of switching costs upon the consumer will exacerbate (Viard, 2000: 3-4).

b. Network effects + incompatibility = switching costs

In section 3.3.1, we postulate that network effects can generate both benefits and detriments to consumers, and the objective of law should be to minimise the detriments without losing the benefits of network effects. To that end, the standard of one network should be compatible with another. This proposal is feasible. As noted in section 1.2.2.c, software is 'liquid', therefore system compatibility is easier to achieve than in the case of hardware.

Indeed, although there are consumers who benefit from network effects, there is no extra benefit from the mere fact that one network is incompatible with another network, at least in the

¹³⁶ Poundstone (1992) *Prisoner's Dilemma – John Von Neumann, Game Theory and the Puzzle of the Bomb*. Oxford Clarendon.

¹³⁷ Under some licensing agreements, users can assign their software license to others, if the number of copies does not increase. However, as old software quickly becomes redundant, it is not easy to determine buyers. Although in reality a secondary market for software exists (see www.ebay.com), no consumers would hope that they could recover their sunk costs in the old programs by selling them in the secondary market.

short-term. On the contrary, incompatibility will result in a loss of benefits of the old network when consumers switch to a new one. Farrell and Klemperer (2002: 3.8) note:

“A move to compatibility has two effects. The *demand effect* is that consumers get more value from the larger network that result from combining two previously incompatible networks, so total demand shifts upwards with compatibility; firms will in general capture at least part of this demand shift. But the *levelling effect* is that consumers will get the same network benefits by buying from either firm, so installed bases and expectations are no longer a competitive advantage, and competition may be more symmetric.”

There can arguably be a long-term benefits from incompatibility, in that the network owner needs to reserve the network for his own so that he can have incentives to innovate and make his network better than the rival network. Nevertheless, according to this theory, one would expect the network owner to take advantage of system compatibility to encourage consumers in rival networks joining his network. The strategy of incompatibility just goes to the opposite direction. A logical answer to these two conflicting arguments is that the network owner would like to create forward compatibility to encourage consumers switching to his network, and to prevent backward compatibility to discourage consumers switching to a rival network. However, if any network owner would think the same, then how can they cooperate to accommodate compatibility among networks? The answer is: they will ‘play safe’ if they are not confident that their networks are better than the network of the rivals, similar to the prisoners in the Prisoner’s Dilemma.¹³⁸ If network owners have equal bargaining powers; and if they have no information on how their networks or rival network will improve, they would adopt a strategy of non-cooperation. Thus, the networks would become both forward and backward incompatible.

The above game between network owners would change if one network is much larger than other networks (see Formula (1) in section 1.3.1.a above). The dominant network owner would

¹³⁸ Baird *et al.* (1994: 42). A prosecutor investigates two suspects. If the suspects keep silent (cooperate), each of them would be released. If one keeps silent and the other confesses, the latter will receive a more lenient treatment than the other. Since the suspects do not trust each other, both will not cooperate (confess), and receive a sub-optimal payoffs (i.e., go to prison).

therefore have more incentive to keep his consumers from switching than to attract new consumers (“one bird in hand is better than two in the bush”). Therefore, he will adopt the strategy of system incompatibility, which in turn gives rise to consumers’ switching costs. This situation has been analysed by Justice Blackmun in *Kodak*. Kodak tied the consumers who bought his equipment to its after-sale services. It alleged that such a tie will increase equipment sale in a market where it does not hold a monopoly power. It further argued that had it overpriced the services, the sale of its equipment would have decreased. Justice Blackmun rejected these arguments, holding that “Kodak chose to gain immediate profits by exerting its market power where [switching costs] ... eliminated any long-term loss” (para. 40).

3.3.3 SWITCHING COSTS AND THE LAW

a. Switching costs and case law

The implementation of the switching costs concept in case law is still limited to two cases in the US (*Lotus v Borland* [1993] 34 USPQ.2d 1014 and *Kodak v Technical Image Services* [1992] 504 US 451) and one case in Europe (*IMS Health*, C-418/01). Notwithstanding the rare examples, the lesson drawn therefrom is rich.

In *Lotus v Borland*, the defendant had copied the spreadsheet presentation of the plaintiff’s program - Lotus 1-2-3, so that the Lotus’s consumers could switch easily to the Borland’s spreadsheet program without incurring the learning costs (a part of switching costs). Lotus had sued Borland for copyright infringement. The Court held in favour of Borland, ruling that Lotus’s presentation was a *scene a faire* (functional elements) and could not be copyrighted (see Lai, 2000; and section 2.2.1). Baird *et al.* (1994: 237) commented that in reality the spreadsheet presentation was not a functional element. However, if the judgment were held in favour of Lotus, switching costs to consumers would have been increased. The *dicta* in *Lotus* also indicates the Court’s intention to save learning costs for consumers: “Borland is merely trying

to give former Lotus users an option to exploit their own prior investment in learning or in macros.”¹³⁹

In *Kodak*, the incumbent defended its tying conduct that it did not overprice consumers for services, because otherwise consumers would have switched to a different product. Justice Blackmun dismissed this argument, referring *inter alia* to the switching costs factor. In paras. 37-39, Mr Justice noted that locked-in consumers would tolerate some levels of service-price increases before changing equipment brands, because of the high switching costs. These costs include not only the equipment purchase (direct switching costs) but also spare parts purchase and services (indirect switching costs). In para. 40 he notes: “there is a question of fact whether [...] switching costs foil the simple assumption that the [upstream and downstream] markets act as pure complements to each other.”

IMS Health involves another type of switching costs, this being the past investment of consumers in data collection. The European Commission surveyed both the competitors in place (NDC and AnzyX Geopharma) and the consumers (the pharmaceutical companies in Germany). The issue was how high the consumer switching costs would be for consumers not to use IMS’s data format and opt for other data providers.¹⁴⁰ Most of the pharmaceutical companies had replied that their switching costs were so significant that they would not switch unless the new database used an identical data format to the format of IMS,¹⁴¹ as a change in the

¹³⁹ Please note that the case *Lotus* is related to a non-innovative element (the command structure) in an innovative market, not a non-innovative market per se. Viscusi *et al.* (2001: 177) consider brand royalty as learning costs, but it is more related to utilities than to switching costs.

¹⁴⁰ See section 1.5.3.b above. The Commission’s survey of 110 German pharmaceutical companies showed that the sector was very strongly economically dependent on the 1860 structure, partly because the pharmaceutical companies had collected and allocated data under the 1860 brick structure.

¹⁴¹ *Id.*, para. 111-12, interview with Bayer, AstraZeneca, Hoffman La Roche, Eli Lilly and Mediac. Please note that not only has IMS invested in developing the 1860 brick-structure, but many of IMS’s clients have also played a significant role in collecting data based on IMS’s structure, through the “RPM Arbeitskreis” (Working Group, see Decision 2001/165 /EC: 74-166).

data format would lead to the loss of relationships between doctors and sale representatives.¹⁴²

At para. 119 of Decision 2001/165/EC, the Commission reports:

“[Although] certain ... pharmaceutical companies were unable to estimate switching costs ... the mentioned costs vary from 40,000DM to 1.85 million DM, around 30 percent of the annual budget for regional sales data for a large pharmaceutical company. For small and medium-size companies, they represent from 25 to 100 percent of the annual budget for regional sales data.”

Notwithstanding this fact, IMS argued that the switching costs incurred was a normal expenditure and irrelevant to the consideration. Advocate General Tizzano rejected this argument.¹⁴³ In the judgement dated 29 April 2004, the ECJ accepted the arguments of both the Commission and the Advocate General. At para. 30, the Court responded to the question of Oberlandesgericht Frankfurt am Main that:

“The degree of participation by users in the development of [a platform or a cross-platform element], *particularly in terms of cost*, on the part of potential users in order to purchase [rival products] presented on the basis of an alternative [platform or cross-platform] are factors which must be taken into consideration in order to determine whether the [copyright] protected [platform or cross-platform] is indispensable to the marketing of [products] of that kind.” (Emphasis added).

Switching costs are now recognised in both Europe and the US as one of the factors that create obstacles for consumers to reach a better product. Courts accept that switching costs may affect consumer welfare negatively; and that although these costs are pervasive, they are a

¹⁴² The assessment and bonus policies for the representatives using the IMS database format would have been modified, see paragraphs 112, 118 and 119 of the *IMS* Decision.

¹⁴³ *IMS Opinion*, paras. 84-85: “to persuade [youngsters] to acquire [a new product], the entrant would have to offer the consumers particularly favourable terms with the risk that the investment made would not be amortised. It must therefore be deduced that ... [switching costs] are elements to be taken into account in establishing whether or not there are obstacles of a technical [including network effects], legislative [including intellectual property rights] or financial nature which may make it impossible ... for any [entrant] to create [its product] possibly in conjunction with [the incumbent’s product].”

relevant factor for considering whether access to a platform or cross-platform element is indispensable to carry out business in a relevant market.

b. Switching costs and legislation

To date, the field where legislation pays most attention to switching costs is telecommunications. The reason for this is that network effects on telecommunications are perceived to be stronger than they are on software industry, so is the impact of switching costs on consumers. As such, the costs and the benefits of regulation are easier to analyse. A policy to reduce switching costs is evident in the US Telecommunication Act 1996 (47 USC § 251 *et seq.*) and the EC package regulations for Information Society,¹⁴⁴ most notably the Access Directive (No. 2002/19/EC). These acts aim to (1) allow users to switch between the service providers without incurring unnecessary switching costs, and (2) promote competition in order to secure lower prices, higher quality services and encourage technological diffusion. As the focus of this research is on the software sector, not telecommunications, the above provisions will be introduced briefly, only to provide an insight into the factor of switching costs.

Section 251 of the US Telecommunication Act 1996 aims at reducing consumer switching costs through three policies: facilities-based interconnection (47 USC § 251.c.2), unbundled access (§ 251.c.3) and resale (§ 251.c.4). The first provision requires all service providers to ensure the inter-connection between different networks.¹⁴⁵ The second provision allows companies to lease the network elements they are missing, such as voice switches, to complete their local telephone system. Section 254 requires all telecommunication companies to allow the entrants in the market to have access to the necessary infrastructures of the network at

¹⁴⁴ These are: Directive 2002/19/EC (Access Directive); Directive 2002/20/EC on the authorisation of electronic communications networks and services (Authorisation Directive); Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services (Framework Directive); Directive 2002/22/EC on universal service and users' rights (Universal Service Directive).

¹⁴⁵ To support this provision, 47 U.S.C. § 251.a.2 requires phone carriers not to create incompatibility between networks and their basic interfaces must comply with a certain statutory standards.

reasonable rates. The third provision requires local carriers to allow users to retain existing telephone numbers when switching from one carrier to another (§ 251.b.2, entitled ‘number portability’). To reduce switching costs further, § 251.b.3 requires all ‘network elements’ to be unbundled, i.e., the incumbent must provide access to the entrants.¹⁴⁶

EC Access Directive (No. 2002/19/EC) covers access to seven elements. They are: (1) network elements, (2) physical infrastructure, (3) software systems, (4) number translation, (5) fixed and mobile networks, (6) access systems for digital TV services, and (7) virtual network services. The products that share common access are grouped into a so-called access market.¹⁴⁷ The Directive requires dominant firms to take reasonable behaviour in the access market, to ensure sustainable competition and interoperability among products. The Access Directive largely follows the principle set out in the Telecommunication Act 1996: interconnection, unbundling local loop and local carriers services.

3.3.4 SWITCHING COSTS AS THE CONSUMER’S BARRIER TO EXIT

The introduction of switching costs creates an impact upon the assessment of market definition and market power. Switching costs constitute a barrier to exit for consumers (see

¹⁴⁶ The Federal Communication Commission (FCC) has identified eight network elements, i.e., local loop, local switching, tandem switching, inter-office transmission, databases and signalling systems, operation support system, operator service and directory assistance (see FCC First Report and Order 96-325, 11 FCC Rcg 15499, 1996 FCC Lexis 4312 (1996)). Local loop is the transmission link between the distribution frame at the central office and the network interface at the customer premises. Local switching is the connection between the local loop and the trunk. Tandem switching is the connection between trunks. Other notions are omitted, as they are technology-specific. See Black (2001: 82-83).

¹⁴⁷ Under UK Communication Bill 2002, access market is the upstream in the value chain of a network, covering any access supplied by the network owner to a service provider wishing to use that facility.

Market Notice: 42; Whish, 2001: 40-41; Farrell and Klemperer, 2002: 36).¹⁴⁸ One may argue that barriers to exit and barriers to entry are two sides of the same coin: consumers exit the old market in order to enter the new markets. This is not correct. Many entry costs, such as R&D, marketing are barriers to entry, but they are irrelevant to consumers. Barriers to entry and barriers to exit from switching costs are often unrelated.

By introducing consumers' barriers to exit, the whole picture of market power becomes clearer. At the moment, the definition of barriers to entry remains controversial. There are two different definitions of barriers to entry. According to Bain (1962), barriers to entry are the factors that permit incumbents to earn monopoly profits, while deterring entrants from coming in. To the contrary, Stigler (1968: 67) defines barriers to entry to be the "costs of producing, which must be borne by entrants but is not borne by incumbents." As such, market share or economies of scale are not barriers to entry but 'natural barriers'. These costs are barriers to entry when they are *higher for a new firm* than an existing firm (*id*: 70). However, if we note that market share represents the installed base of a network (see section 1.3.1.b and 1.5.1), its combination with system compatibility will create barriers to exit rather than barriers to entry. Regardless of the definition of barriers to entry, a barrier to exit prevents consumers from choosing the optimal product.

Not only could switching costs be used to identify market power, but these costs could also affect consumers more significantly than barriers to entry. When barriers to entry are high but switching costs are low, competition can reduce prices and improve quality (competition on the merits).¹⁴⁹ When barriers to entry are low but switching costs are high, the incumbent faces no

¹⁴⁸ Please note that the concept of 'consumer's barriers to exit' in this thesis is different from the concept of 'incumbent's barriers to exit'. Porter (1980: 20) defines the latter concept as "the economic, strategic and emotional factors that keep the incumbent competing in the business although they may be bearing low or even negative returns on investment."

¹⁴⁹ The online book retailing market is another example: barriers to entry were high (high advertising costs, price information is transparent) but the barriers to exit were negligible. Consumers can switch from Amazon.com to BN.com (Barnes & Noble) easily. Therefore, price will neither increase nor decrease (Laticovich and Smith, 2001).

pressure to reduce the prices, and may increase them. As Farrell and Shapiro (1988) have shown, consumers are more likely to suffer detriment when switching costs are high than when barriers to entry are high. Table 4 below illustrates the decrease (\downarrow) and increase (\uparrow) in potential consumer detriment in relation to the change of switching costs and barriers to entry.

Table 4: barriers to entry, switching costs and detriment to consumers on prices

Barriers to entry	Switching costs	Potential detriment to consumers
\uparrow	\uparrow	\uparrow
\uparrow	\downarrow	\downarrow
\downarrow	\uparrow	\uparrow
\downarrow	\downarrow	\downarrow

3.3.5 SWITCHING COSTS, EFFICIENCY AND DETRIMENT TO CONSUMERS

In a perfect competitive market, the value of a product depends on the utility (U) it brings to its purchaser (product utility). From the seller's viewpoint, such a value is reflected in the price (P). A transaction takes place when the consumer values U more than P (see e.g., Stiglitz and Driffill, 2001: 137). For any given product (i), we have: $U_i \geq P_i$ (*).

In a perfect competitive market, if $U_i < P_i$, then the rational and self-interested consumers will search and switch suppliers until $U_i \geq P_i$. As Werden (1997) explains, the amount $U_i - P_i$ is consumer surplus, which is the difference between what the consumer could have paid (demand curve) and the amount he has already paid (market price).¹⁵⁰ The balance $U_i = P_i$ shows Pareto equilibrium (see section 1.2.1.a above). If we add indirect switching costs (S) to the variable, then the consumer would not switch if $U_1 + S_1 \geq P_2 = U_2$ or

¹⁵⁰ Werden (1997) "An economic perspective of the analysis of merger efficiency" *Antitrust*, Summer '97.

$$S_1 \geq U_2 - U_1 = \Delta U \quad (2)$$

According to Viscusi *et al.* (2001: 177-81), when consumers do not switch even if the utility surplus exists ($\Delta U > 0$), the market is Pareto inefficient and the consumer's choice is sub-optimal (the upper area between the line $S = \Delta U$ and the vertical axiom of switching costs). In this case, even if product 2 creates more efficiency/utility than product 1, the consumer will only switch to product 1 when:

$$U_2 \geq R_1 (= U_1 + S_1) \geq P_1, \text{ or } \Delta U = U_2 - U_1 \geq S_1 \quad (2a).$$

The relationship between switching costs and utility surplus is presented in Figure 16 below.¹⁵¹

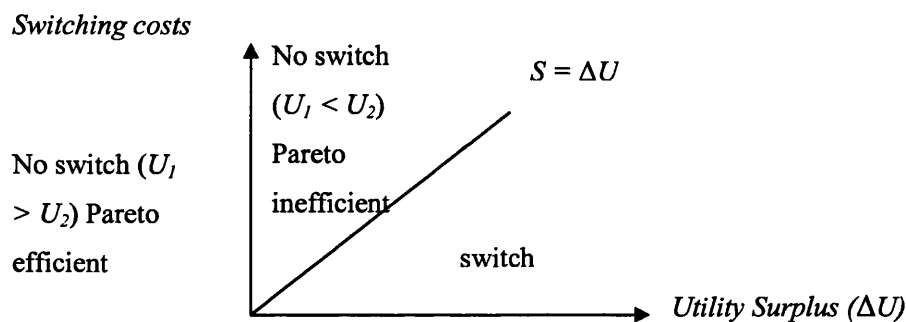


Figure 16: conditions for switching

Formula (2) is similar but not identical to the formula of Farrell and Klemperer (2002: 9). In the latter, the authors set a model of competition between two products. They set:

$$R = S + P$$

¹⁵¹ This chart is adopted as analogy from Breuhan (1997: 8), but he used net benefit and network externalities instead of utility surplus and switching costs.

where R is the reserved (maximum) price that the consumer would pay for a product. P is its price (Farrell and Klemperer call it the cost of buying the product). S is the switching costs related to the product.

To the above Formula, I have replaced P by utility (U), because utility can represent the benefit and detriment to consumers better (see section 3.2.2). For example, an expensive product can bring a great value to the consumer and therefore cannot be a detriment. As $U > P$ (see Formula (*) above), we obtain:

$$\text{If } R = S + P \text{ and } U > P, \text{ then } U + S > R.$$

As R is the reserved price (the highest price the consumer could pay for a product), it will be higher than any price P . If $U + S > R$, and $R > P$, we then have: $U + S > P$ as presented in Formula (2) above. To conclude, the difference in the approaches is that Formula (2) focuses on consumers' interests, as opposed to the formula of Farrell and Klemperer, which focuses on the suppliers' interests.

Figures 16 above and 17 below also show that the larger the switching costs, the larger the utility surplus required for a switch. Hence, there are two scenarios where consumers suffer detriment from high switching costs:

- 1) Exploitation of a situation where utility surplus cannot be higher than a set level ($Max \Delta U$). When consumers do not need innovation in a market, the only way to increase utility is to decrease price. However, price cannot go down forever. Its minimum level is the marginal cost, so the maximum level of utility surplus that a new product can bring to consumers is set as the difference between the incumbent's price and the entrant's marginal cost. At the same time, switching costs keep rising. Consumers refuse to switch regardless of the utility surplus provided by the entrants when:

$$MinS > Max\Delta U \quad (3)$$

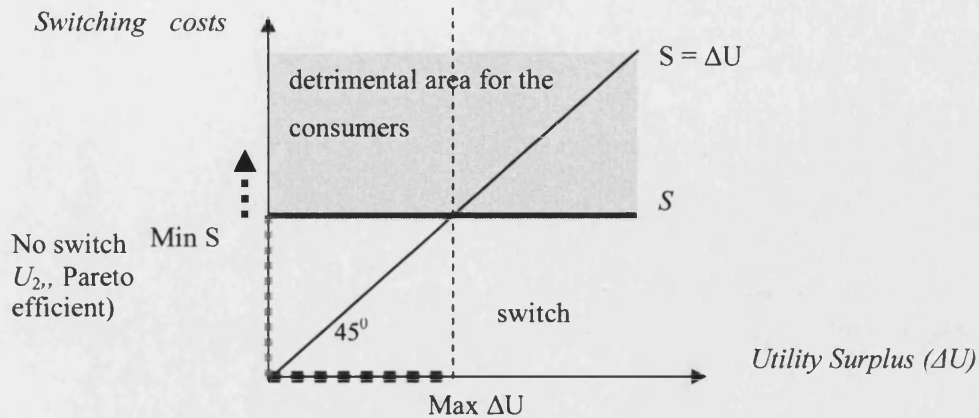


Figure 17: two methods to exploit switching costs

- 2) Intentional increase in switching costs. The raise of S creates a gap $\Delta U = S$ in the horizontal axis (utility surplus). Thus, even when $\Delta U > 0$ (the new product is better than the old one) the consumers still stay with the old product. The higher the switching costs, the larger the economic rent created by the gap $\Delta U = S$. An intentional rise of switching costs by the incumbent in order to prevent consumers choosing a better product might therefore amount to an abuse. As held in *Hoffman-La Roche* (para. 125), ‘prejudice to consumers’ under Article 82.b EC does not only mean direct detriment in terms of money loss, but also an impairment of an effective competition structure. In our scenario, this structure prevents consumers from choosing optimal products.

In both scenarios, consumers suffer detriment because they cannot opt for a better product ($U_2 > U_1$) even if they want to. In both cases, switching costs should be reduced so that consumers can switch to a better product, especially in the second scenario. If the reason for high switching costs is the incompatibility between the old and the new products, a solution can be to grant a necessary license so that compatibility is guaranteed.

Between the two scenarios, the first call for legal intervention more urgently than the second does. When $Min S > Max \Delta U$, reducing switching costs through MIE license is the only way to help consumers switching to a better product. As for the second scenario, one may argue that

high switching costs will motivate entrants to innovate and bring more utility surplus to the consumer (so that $\Delta U > S$). Moreover, if there is a demand for innovation, the entrant must satisfy it before seeking an MIE license. A too lenient compulsory license regime would nurture a free-riding attitude among entrants (see the argument of Posner and Formula (1) in section 1.2.1.b above). Moreover, the court should not limit the rights of the rightholder, except to the extent necessary for the attainment of a worthwhile public benefit (Goyder, 2003: 301). Therefore, easy cases (the first scenario: $MinS > Max\Delta U$, non-innovative market) are analysed first. The second scenario will be considered in Chapter 4.

If we compare this solution with the orthodox approach of the ECJ under Article 82 EC (market-dominance-abuse, see section 1.5.1), we could see that:

- In non-innovative market, the proof of $Min S > Max \Delta U$ furnishes the ‘dominance’ condition. This scenario in a non-innovative market is sufficient to prove that consumers are suffering detriment. Unless the incumbent can justify his conduct, a refusal to license the MIE is an abuse.
- When $Max \Delta U$ cannot be estimated because the market is innovative, dominance can be shown by traditional tests such as market share, barriers to entry and barriers to exit (see sections 1.5.1.b and 3.3.4). However, such a dominant position does not presume abuse. The entrant must prove that the incumbent intentionally increase switching costs instead of competing with him on the merits; and that if competition on the merits had taken place, the entrant would have gained more market share and consumers would have benefited more. Moreover, the incumbent must fail to prove that his conduct is justifiable. After these two steps, the court can weigh costs against benefits and decide whether the conduct in dispute is abusive.

3.4 *MIN S > MAX ΔU* IN NON-INNOVATIVE MARKETS

There are two approaches to prove the formula $Min S > Max \Delta U$ in non-innovative markets. We may either calculate $Min S$ and $Max \Delta U$ separately, or calculate $Max \Delta U$ first, $Min S$ later. The advantage of the second approach is that the formula $Min S > Max \Delta U$ is provable even without determining exact $Min S$. As noted in section 3.3.2, there are two types of switching costs: transaction costs (T) and learning costs (L). If we can prove that $Min T > Max \Delta U$, or even a fraction of $Min T > Max \Delta U$, the formula $Min S > Max \Delta U$ is obviously proved, without knowing an exact amount of $Min S$. We can prove this conclusion by a transitive rule that if $a > b$, $b > c$, then $a > c$. Let denote: a is the minimum total switching costs (S), b is the minimum transaction costs from system incompatibility (T_x), and c is the maximum level utility surplus ($Max \Delta U$). We then have: $Min S > Min T_x$, $Min T_x > Max \Delta U$, therefore $Min S > Max \Delta U$. We will therefore follow the second approach.

3.4.1 MAXIMUM UTILITY SURPLUS

According to Pindyck and Rubinfeld (2001: 73), consumer utility of a product is quantified primarily by its price and quality. In the equation $\Delta U = U_2 - U_1$, U_1 of product 1 will be stable if (1) the product's quality cannot be improved and (2) its price is unlikely to be reduced. The first condition can be satisfied in the non-innovative market, where consumers have no interest in constantly innovative product and competition is mainly on prices (see section 3.2.3 above). The second condition can be demonstrated in Figure 6 (section 1.2.1.b above), when the incumbent holds a monopoly power. The surplus between U_2 and U_1 will be the difference in prices of the two products. The maximum utility surplus ($Max \Delta U$) will be the *difference* between the incumbent's price for the product in dispute and the lowest possible price for a similar product provided by the entrant. As in a non-innovative market, a reasonable price cannot be lower than its costs (see *General Motors* [1975] ECR 1367). Therefore, $Max \Delta U$ should be equal to the difference between the most-efficient average total cost of the product in dispute and the product's price offered by the incumbent. For example, in *IMS* (Decision 2002/165/EC, para. 119) the maximum utility surplus ($Max \Delta U$) that the German pharmaceutical companies enjoy in the market for pharmaceutical data would have been the

difference between the prices of IMS product and the total average costs of producing the rival product (supposedly 'better' product). In short, the questions in determining $Max \Delta U$ are how and to what extent ΔU can be improved?

When $Max \Delta U$ can be estimated, we can compare it with $Min S$ (or $Min T$) and conclude whether $Min S > Max \Delta U$. If yes, then the consumers suffer detriment, because their reasonable demand in ΔU is not satisfied. As long as $Min S > Max \Delta U$ and switching costs cannot be reduced by other means, the MIE compulsory license will be considered, subject to the justifications of the incumbent, which will be discussed in Chapter 5.

With respect to the youngsters, $U_1 = 0$, $\Delta U = U_2$, and S should be zero. If the youngsters have freedom of choice before buying the incumbent's products and become the oldsters, the incumbent can raise the defence of *volenti non fit injuria* (see section 3.1.2.c). On the contrary, if vertical network effects are strong, the utility concept should mean the total utilities from the upstream and the downstream products (see Farrell and Klemperer, 2002: 12). The condition of detriment to consumers $Max (U_2 - U_1) < S$ cannot be estimated by simply comparing the utilities of two products in the same market. We have to take into account the switching costs in the vertically connected market (S'). The lock-in condition will be $Max \Delta U = Max U_2 < S'$, and from there the method of calculation will follow the arguments set forth in the preceding paragraphs.¹⁵² This conclusion is consistent with section 1.5.3.b above.

¹⁵²

For example, a consumer who has Windows 95 pre-installed in their PCs would be hesitant to buy a new digital camera, because Windows 95 does not support the software program that recognises and prints pictures for the camera. He has a choice between not buying the digital camera, and installing Windows XP on his current PC. The costs of installation include the cost of saving and converting all data in the Windows 95 programs, the costs of buying Windows XP and all related applications (see CCIA 2003b: 4).

3.4.2 MINIMUM SWITCHING COSTS

a. Minimum transaction costs

To put the multi-layered information system in context, software's transaction costs are involved in the content layer (consumer investment), the code layer (related software programs) and the physical layer (hardware). The central question is to identify what the minimum costs would be to reuse consumers' past investments, or to prevent consumers from losing the positive network externalities (see section 3.3.2.b). In other words, what does it take for consumers (the oldsters) to switch?

The minimum transaction costs would be the costs of reusing expenditure that the users spent in the contents by allowing system compatibility, and if such a reuse is impossible, the costs of forfeiting it. These will depend on two indicators: (1) the possibility of content reuse and (2) the convenience of reuse.

The size of the first transaction costs will depend on their reusability of information and data that consumers would have collected in the course of using the incumbent's product. We can quantify this cost by answering the following questions:

- (1) Are the data formats of the entrant and the incumbents compatible? If they are (e.g., the formats of Microsoft Office is compatible with the formats of Sun's Open Office), the cost stemming from incompatible data format equals the time spent waiting for the conversion.
- (2) If the formats are not compatible but it is possible to convert the formats in the old files into the new format automatically by a gateway (e.g., the conversion of Word formats into PDF formats through Acrobat Adobe Distiller), what are the cost of purchasing the gateway and the time spent for the conversion?

- (3) If the two formats are incompatible but manual re-formation of the files is possible, what is the cost of manual conversion?¹⁵³
- (4) If the two programs are incompatible and conversion is impossible even manually, or the re-creation of the old contents is more costly than forgoing them and starting a new content, what is the cost of the consumers to rebuild a completely new content?

The same assessments about the content layer can also apply to the code layer and the physical layer (see e.g., Gandal *et al.*, 2000: 43). That is, the size of the switching costs will be proportionate to (i) the cost of making a new hardware or software product to interact with the existing products, and if this interaction is impossible, (ii) the cost of changing the whole bundle of interacted hardware or software. This task seems difficult in theory, but the *IMS* case (section 3.3.3 above) shows that at least the cost stemming from incompatible data format can be estimated in practice.

The second indication of transaction costs (the convenience of reuse) will depend on many factors, such as the arrangement of data library or the speed of downloading one type of data as opposed to other.¹⁵⁴ These factors can be difficult to quantify. However, if the cost stemming from incompatible data format or interface alone (a component of switching costs) has already been larger than the maximum level of ΔU , we would have $Min S > Max \Delta U$, regardless of the costs of convenience in reuse.

¹⁵³ A good example would be the manual copying a text document in MS Word, as text-only format (ASCII) and pasting it into a Linux word processor, then inserting styles into the ASCII format. The larger the number of Word document files, the higher the switching costs.

¹⁵⁴ See e.g., the comparison between two media players RealOne and WMP in PC Magazin, 17 Oct. 2002 <<http://www.pcmag.com>>, accessed 4 Apr. 2004: "As a jukebox, RealOne is generally faster than WMP in ripping and burning, especially on non-XP platform where WMP is limited to 2X burning. Users will find RealOne's tagging and auto-playlist functions superior to WMP's, though the reverse is true for those running Windows XP."

b. Minimum learning cost

‘ Although learning cost can be observed (see *Lotus v Borland* in section 3.3.3.a above and the QWERTY case),¹⁵⁵ it is difficult to quantify, unless rigorous tests and consumer surveys are taken (see section 4.4.2 below). To save litigation costs, the calculation of learning cost will be taken into account only when the formula $Min S > Max \Delta U$ cannot be proved solely by a calculation of minimum transaction costs (see subsection (a) above).

CONCLUSION

As held in *Magill*, consumers suffer detriment when their reasonable demand is not satisfied because of the incumbent’s conduct. A reasonable demand arises when there is a utility surplus (ΔU), a factor that prevents this surplus from materialising and may create consumer detriment. In the spotlight of this chapter are indirect switching costs, the costs of replacing one product with another. When these costs exceed the maximum level of utility surplus that can reflect the reasonable demand of the consumers, they can exclude consumers from switching ($S > Max \Delta U$). As switching costs increase day by day, the barriers to exit resulting from switching costs will give the incumbent economic rents to exploit. When the market is affected by network effects, switching costs may prejudice not only the oldsters but also the youngsters. Thus, a solution to this problem is not to increase ΔU but to minimise S . One way to achieve this goal is through an MIE license to an entrant who is capable to bring about ΔU to consumers. The license in itself does not guarantee a Pareto efficient outcome, but it will reduce switching costs, making an efficient outcome plausible.

The burden of proving $Min S > Max \Delta U$ shall be on the entrant, who needs to measure both $Max \Delta U$ and $Min S$. The central questions of estimating $Max \Delta U$ are how and to what extent the

¹⁵⁵ Leeds (1997); Schneiderman (1998: 309). Dvorak typesetting for keyboard increases the speed of typing, compared to Scholes’ QWERTY typesetting, but users have refused to switch, because of the learning cost involving in the Dvorak typesetting. For the counter-arguments, see Liebowitz and Margolis(1990).

consumer's utility in a product market can be improved. The question of *Min S* is what it takes, for consumers to switch from using one product to another substitutable product.

CHAPTER IV: SWITCHING COSTS AND DETRIMENT TO CONSUMERS IN INNOVATIVE MARKETS

The aim of this chapter is to define detriment to consumers when the MIE owner raises switching costs in innovative markets, where $S > \Delta U$, but it is unclear whether $\text{Min } S > \text{Max } \Delta U$. As discussed in section 2.1.1, when innovation is at high speed, utilities change, old standards are replaced, and those who prevail must quickly diffuse their technology to build a consumer base against rivals' intrusion. More importantly, high R&D sunk costs needs to be recovered, sometimes by monopoly profits. In short, we cannot apply a theory that works in a non-innovative market to an innovative market unless the circumstances between the two are similar. The definition and characteristics of innovative markets are analysed in sections 4.1. This section discusses the flaws in the argument that high switching costs will motivate innovation, paving the way for analysing consumer detriment in the following sections 4.2 (direct detriment) and 4.3 (indirect detriment). As noted in Chapter 3, direct detriment was caused by the incumbent exploiting a market when switching costs are already high. Indirect detriment is caused by an intentional raise in potential switching costs to prevent competition on the merits, thereby consumers cannot choose the best product in the market. We now generalise this assessment in innovative markets.

4.1 DEFINITION AND CHARACTERISTICS OF INNOVATIVE MARKETS

4.1.1 INNOVATIVE MARKETS AND EXPECTED UTILITIES

Put it simply, an innovative market is the one that does not belong to the non-innovative group, as prescribed in section 3.2.3. In innovative markets, consumers demand their products to be constantly changed and improved.

The innovative market concept is similar but not identical to the idea of innovation markets under the *IP Guidelines*. According to the *IP Guidelines*, sec. 3.2.2 and 3.3.1, an innovation market involves “R&D directed to particular new or improved goods or processes and ... the effort, technologies and goods that significantly constrain the exercise of market power with respect to the relevant R&D.”¹⁵⁶ Unlike an innovative market, an innovation market may include many product markets using the same technology.¹⁵⁷ Both concepts, “innovative” and “innovation” markets are similar in the sense that they are dependent on the prerequisites that favour innovation, including consumer demand.

Under dynamic competition, the concept of static utility (U) in a non-innovative market will be replaced with the concept of ‘expected utility’ ($U(x)$), which indicates how utility of a particular product x will change in the future. Von Neumann and Morgenstern (1944: 25) formulated this concept as follows:

$$U(x) = \sum_{x \in S} p(x)u(x)$$

U is the expected utility, $u(x)$ is the payoff of the state x and $p(x)$ is the probability that state x occurs (i.e., the expected utility will increase or decrease).¹⁵⁸ In other words, expected utility of an outcome is the payoff assigned to its occurrence, multiplied by the probability of its occurrence (see Blackburn, 1996: 130).

¹⁵⁶ Innovation and innovative markets can overlap with each other, e.g., the market for media player is innovation in terms of technology, and innovative in terms of consumer demand. This taxonomy has been debated in Europe, see *Shell/Montecatini* OJ [1994] L 332/48, Lang (1996) and Landman (1998). See also OECD (2000: 206-208).

¹⁵⁷ However, the ‘innovation market’ concept is rarely applied in case law, and it is elaborated only in the *IP Guidelines* and OECD (2000). The lack of testing cases prevent me to analyse this concept further. To keep the analysis consistent with Chapter 3, I will elaborate the concept of innovative market rather than innovation market.

¹⁵⁸ For a simple proof of this formula, see McKenna (1986: 21- 25).

There are two conceptions of probabilities - mathematical probability and inductive probability. Mathematical probability is a non-negative set of functions whose maximum value is unity (Blackburn, 1996: 304). It follows the rule of Pascalian conjunction, which states that the probability that two independent events will occur is the multiplication of the probabilities for the separate events: $p(A \text{ and } B) = p(A)p(B)$ (see Cohen, 1977: 58-68). To estimate the probability of each individual event, experiments and frequency measurements are the relevant tools. One can make several trials and then find the “most probable” conclusion.

Mathematical probability has little application in finding an outcome of a case law. Posner (1999: 81) remarks that a court is likely to make only one decision, and then follow the precedent. It would be hesitant to admit the errors made in the past. Nevertheless, mathematical probability is still useful in this thesis that if an event happens more frequently than others do, the former is more likely to bear the true value. This method of assessment will be used in section 5.2.2.b to calculate the chance for the incumbent to recover R&D sunk costs.

As an alternative to mathematical probability, Carnap (1962: 24) and Blackburn (1996: 304) note that inductive probability statements offer not empirical measures of frequencies, but measures of possibilities left open by the evidence and by the hypothesis. This type of probability is used in the fact-finding process before courts, entitled the balance of probabilities. In *Societe Technique Miniere v Maschinenbau Ulm* [1966] ECR 235: 249, the ECJ held that a decision should be “foreseen with a sufficient degree of probability of a set of objective factors of law or of fact.” In *Verizon*, the US Supreme Court has also used the inductive probability method when referring to *Aspen Skiing* [1985] 472 US 585.¹⁵⁹

Although bearing the name ‘probability’, a balance of probabilities is based on inductive experience rather than mere mathematical calculations (see *Hornal v Neuberger Products* [1957] 1 QB 247: 266). Instead of following an investigation based on trial and error and analysing the frequencies under mathematical probability, each piece of evidence will be

¹⁵⁹ The Court held: “[a refusal to deal] of a voluntary (*and thus presumably profitable*) course of dealing *suggested* a willingness to forsake short-term profits to achieve anticompetitive end (*Aspen*, at 610-611).”

“graded” as to its admissibility and its relevance to the hypothesis, based on *common sense* and *experience*. Lastly, graded evidence will be “weighed” to confirm or reject the hypothesis.¹⁶⁰ By weighing and grading evidence, the court can decide whether or not the evidence is relevant to the dispute and whether or not it confirms or negates our hypothesis. According to Scolnicov (2000), mathematical and inductive probabilities are two sides of the same coin: they strike a balance between different scenarios and predict the most likely outcome of an event. However, instead of trial-and-error in order to ‘grade’ the evidence in mathematical probability, inductive probability method ‘grades’ the evidence by common sense, logic and experience.¹⁶¹

The preliminary assessments on expected utility and probability ground the next discussions of whether innovation in ‘innovative markets’ will be constrained by high switching costs.

4.1.2 HIGH SWITCHING COSTS AND COMPETITION ON THE MERITS

In 3.3.5, I hypothesise that when $Min S > Max \Delta U$, the only method to improve consumer welfare is to minimise switching costs (S), by an MIE license. If we cannot identify a maximum level of utility nor a better product than the incumbent’s product, will an intentional act to raise switching costs decrease consumer welfare? As noted in 3.3.1.b, Farrell, Klemperer, Chen and Hitt have argued that rising switching costs can improve consumer welfare because it can prevent ‘inefficient switching’. In addition, Schmalensee (2000: 193), Liebowitz and Margolis (1998 and 1999) argue that switching costs accelerate competition on the merits, because when facing a market with high switching costs, an entrant will have to provide a utility surplus sufficiently large to attract consumers. As such, switching costs accelerate innovation and

¹⁶⁰ The process of inductive probability is also referred as confirmation theory, started by Leibnitz and developed by Carnap (see Blackburn, *id*: 75 and 304; Paton, 1972: 597).

¹⁶¹ Keane (2000: 20). According to Lord Simon in *DPP v Kilbourne* [1973] AC 729: 756, “evidence is relevant if it is logically probative or disapprobative of some matter.” Denning J in *Bater v Bater* [1950] 2 All ER 458, at p. 37 said: “in civil cases ... there may be degrees of probability within a standard, ... depending on the subject matter.”

competition on the merits. However, innovation does not come from thin air without some necessary conditions.

To analyse the factors that favour or disfavour innovation, we can use the ‘diamond model’ of Michael Porter (1980: 4, 1998: 35). In this model, innovation is driven by internal and external forces. The internal force is the scientific base of each firm. The four external forces (similar to four ‘angles’ of a diamond) are the consumer demand, the support from the upstream markets (e.g., control of the MIE), the threats of substitute technology and the threats from the entrants.¹⁶² Kamien and Schwartz (1982: 33-40) also demonstrate that innovation accelerates or retards thanks to two forces: the pushing forces from technology and the pulling forces from consumer demand and market leverage (see section 1.5.1.b). Compared to the diamond structure of Porter, the pulling forces are the consumer demand and support from the upstream market. The pushing forces are the threats from the entrants and technology development.

Among the external forces, the pulling force appears to be the most determinative factor. There must be a sufficient consumer demand to justify innovation. If for every one dollar in R&D investment, the incumbent cannot increase sales more than one dollar compared to the *status quo*, he will not innovate. However, sales revenue depends on consumer spending. In turn, the consumer must analyse costs and benefits before deciding whether he should spend money on a new product, taking into account their existing constraints of the network effects and switching costs. If, after striking the balance, the consumer still demands an innovative product, and the incumbent’s sale revenue will increase to the extent higher than the R&D investment, then he will innovate. The question is how to set a market structure and a business model, so that when the consumer compares between the costs and the benefits, he will demand innovative products, if not in the short-term, then in the long-term.

¹⁶² One could question whether there should be more than four external factors that affect innovation. This is not the issue. The issue is that there are driving forces for innovation, and if there is no such driving forces (incentives), firms will not bother innovating, see Stiglitz and Driffill (2000: 25).

In section 1.2.2, we note that software has three characteristics: public goods (high fixed cost, low marginal cost), durable goods (no depreciation), and liquid goods (reusability on multiple platforms). Each characteristic suggests a different business model. As the marginal cost is low, the optimal business model of public goods requires network expansion, which is conditioned upon stable standards. However, because the goods are 'durable', firms must innovate to attract consumer demand. Let denote $p(A)$ as the probability that network effects associated with a particular product will increase, $p(B)$ is the probability that the producer will innovate to improve the quality of its product. According to the Pascalian equation in section 4.1.1.b, the probability that the expected utility in a product will change is $p(A \text{ and } B) = p(A)p(B)$. When the tendency of durable goods decreases ($p(B)\downarrow$) and the tendency of public goods increases ($p(A)\uparrow$), the market may become less innovative; because it is unnecessary to innovate in order to increase the total utility of a product. Network externalities will generate added values to the existing product, and increase $p(A \text{ and } B)$.

However, saying that network externalities discourage innovation is not correct. As analysed in section 3.3.2, network externalities have dual effects. The positive effect stems from the consumer's demand for a standardised product. The negative effect stems from system incompatibility. Without the incompatibility problem, network effects would not become switching costs. Fortunately, this problem can be solved because software is a liquid goods. By MIE license, both $p(A)$ (network effects) and $p(B)$ (innovation) would increase; and $p(A \text{ and } B) = p(A) p(B)$ would also increase. A wise policy to develop a software market would be to minimise the negative impact of network effects by MIE license without affecting their positive impacts. This means switching costs should be minimised.

4.2 DIRECT DETRIMENT FROM THE ABUSE OF SWITCHING COSTS

Do we need to identify consumer detriment in an innovative market before concluding that an act was abusive, or it is sufficient to show that switching costs have negative impacts on innovation, as argued above?

Fischer and Rubinfeld (2001: 6) argue that it is unnecessary to prove consumer detriment for a conduct to be held abusive, due to three reasons. Firstly, antitrust law does not require proof of detriment to consumers; otherwise, the court must wait until consumers actually suffer harm in order to furnish the evidence. Secondly, to require proof of detriment would be to immunize any predatory practice. These practices may provide initial consumer benefits, but it can give rise to detriment to consumers if the pattern of product innovation, pricing and quality is adversely affected by the improper use of monopoly power. Thirdly, the fact that innovation can bring some consumer benefits should not justify anticompetitive acts.

Although the arguments of Fischer and Rubinfeld are plausible, they also imply that competition authorities can sanction innovative firms when consumers do not suffer any harm. Such an outcome is unacceptable. If the authority cannot show an actual detriment, then at least it must show that the probability of detriment to consumers is high unless the competitors can access the MIE.

Why would the incumbent risk prejudicing consumers, when it needs consumer positive feedback and support? To answer this question, I return to the assumption that firms want to maximise profits by raising revenues. As the revenue from a product equals sale quantity multiplied by price ($R = PQ$, see section 1.2.1.b), there are two equivalent methods to maximise profits: setting high prices (P), or raising switching costs to enlarge the network and secure a large customer base (Q).¹⁶³ By practising pricing or non-pricing strategies, the incumbent can use switching costs in order to eliminate competition on the merits. His conduct is detrimental to consumers because the later must choose sub-optimal products. This does not affect the consumer's positive feedback because he is already locked-in by switching costs.

¹⁶³ For example, Farrell and Klemperer (2002: 9) have seen the negative impact of switching costs to efficiency, but only from the pricing perspectives (see “bargain-and-ripoff” in section 1.5.3 above). They have not seen that the most dangerous impact of raising switching costs is not on the price, but on the market share and on the costs themselves.

4.2.1 PRICING PRACTICES: MONOPOLY PRICE MAINTENANCE

The simplest form of switching costs abuse is to impose excessive prices. To measure the extent that switching costs can provide an opportunity to increase prices, Farrell and Shapiro (1988) and Rasmusen (1998: 123) formulate a game between the incumbent and the entrant, with both the youngsters and the oldsters, over two similar products. Their conclusion is that if the incumbent sets the price for his product (P) below twice the switching costs ($2S$), then the oldsters would not switch. The higher the switching costs, the higher the rents extractable and the higher the margin that prices may increase to capture the rent.¹⁶⁴ Moreover, consumers can also suffer detriment when the price is high from the beginning,¹⁶⁵

The incumbent can increase the prices or reduce the quality of its products in a market with high switching costs not only once, but also repeatedly over a long period without switching. Suppose that the costs of switching from product A to product B are S , the annual price for the product A is increased from U_a to $U_a + S/2$. Since the increase is below S , consumers might think it is better to remain with the old product than to switch. Over three years, the increase will be more than S , but the consumers cannot recover the extra amount they have paid ($S/2 \times 3 = 1.5S$). Therefore, they will stay with product A. Hence, if the prices increase in a market with high switching costs during a long period without justification, this practice is detrimental to consumers and is an abuse.

For pricing practices, the ultimate solution would be to allow the entrants to enter the monopolised market by a MIE license, so that they can compete with the incumbent on the

¹⁶⁴ An example is *Mars v Teknowledge* [2000] FSR 138, Judge Jacobs noted that Mars' consumers have failed to change the coin recognition machine every time new coins were introduced, due to the fact that the cost of replacing Mars' machine with a rival machine is 30GBP, whereas the cost of upgrading the software to recognise new coins are 10GBP. Over three times, the costs of maintenance surpass the replacement cost.

¹⁶⁵ For example, the price of Windows has not been increased, although exceptionally Microsoft could be challenged for its high price maintenance. In preparation for a class action against Microsoft in 2003, economists for 500,000 buyers of Windows operating system in the US estimated that they were overcharged by US\$11 billion. Microsoft agreed to settle the case for US\$1.1 billion. See *NY Times*, 6 Aug. 2003: "Microsoft Set to Close Windows Settlement."

merits. If there is no such capable entrant, the competition authority may pursue the 'second-best' measures, such as price adjustment. However, antitrust authority should not intervene merely because the price charged to the consumers was 'high', if it does not know what price is low.¹⁶⁶ The optimal way to find out the 'low' price is through competition. Otherwise, the prospective of consumer benefit from price regulation would be uncertain.

4.2.2 NON-PRICING PRACTICES: FORCED UPGRADE AND INEFFICIENT SWITCHING

Although consumer detriment from unjustified pricing practice can be readily shown, price increases in the software sector is rare. Admittedly, software prices have not been reduced as dramatically as hardware prices, but equally they have not been increased. Subramanian (2000) asserts that when switching costs are high, the incumbent prefers maintaining the price to increasing it, because an increase in price may alert competition authorities. Moreover, raising prices would effectively reduce the utility of the product in the eyes of the consumer, making switching more feasible. That is why non-pricing practices have occurred more often in networked economies (see e.g., CCIA, 2003b). Regrettably, many studies on switching costs, such as Chen and Hitt (2001); and Farrell and Klemperer (2002) only focus on pricing practices and do not pay sufficient attention on the non-pricing ones. Below I will consider two typical non-pricing practices that exploit markets with high switching costs.

a. *Forced upgrade*

Section 3.3.2 above concludes that the condition for switching is $S_1 + U_1 < U_2$. The problem with forced upgrade is that the incumbent can decrease U_1 by manipulating S_1 and S_2 . When U_1 has been decreased to become U_1^* (e.g., because the old product will no longer supported by the incumbent or backward incompatibility), we have a condition favourable for switching:

$$U_2 > S_1 + U_1^* \text{ even if } U_2 = U_1.$$

¹⁶⁶ The European Commission so far has only intervened in the case of 'excessive' price when such a price is higher than the price of a parallel imported product (see *BL v Commission* [1986] ECR 3263).

Forced upgrade is only possible in the market with high switching costs. The incumbent can decrease U_1 without fearing that its consumers will switch to a competitor's product instead of the upgraded product because switching costs to a rival product is high (due to system incompatibility), whereas the switching costs to the upgraded product of the incumbent is low (as both products are compatible to each other).

Can forced upgrade give rise to consumer detriment? To answer this question, please note that many consumers may refuse to switch, because they think the old product (e.g., Windows 2000) is better for them than the new one (e.g., Windows XP). However, when the incumbent refuses to support the old products, the 'obstinate' consumers will suffer from disutility. In so doing, the incumbent may urge these consumers to upgrade (switch), even though they do not value the new versions as high as the other consumers do.¹⁶⁷ This may explain why expenditure on software upgrades by corporate user is often larger than the initial investment.¹⁶⁸ Statistics show that on the average 35 percent of software maintenance and upgrade's expenditure is affected by switching costs, not by the merits of the upgraded products.¹⁶⁹ Powell (1999: 176-77) notes that a number of mergers and acquisitions in the UK building industry had been abandoned due to the incompatibility of the data-processing systems of both parties.

Upgrades do not necessarily reflect consumer demand or competition on the merits. In December 2003, AssetMetrix (www.assetmetrix.com) published an inventory data of over

¹⁶⁷ For other methods to extract surplus through versioning and upgrade, see also *Media Market, Economics*: 14-15. Farrell and Klemperer (2002: 18) also demonstrate that with network effects and incompatibility competition, the consumers' desire to be compatible with other overwhelms their differences in tastes.

¹⁶⁸ Lientz and Swanson (1980), Nosek and Pavia (1990: 157-74) showed that large organisations usually devote about 50 to 75 percent of programming expenditure to system maintenance. Somerville (1995: 660) observe that large expenditure on software maintenance is attributed to, *inter alia*, backward systems that still require maintenance and constant upgrades, or changing systems that lead to the degrading of the old system, as the new programs have become less cohesive.

¹⁶⁹ *Id.* About 65 percent of maintenance up to 1995 was perfective (adding new functions to the existing system), 18 percent was adaptive (changing software to new environments), and 17 percent was corrective (fixing reported errors). See also *Media Market, Economics*: 78.

370,000 PCs - from over 670 companies in Canada on their desktop operating system (OS). This survey found that an average of 39 percent of the PCs were running Windows 98 or Windows 95, compared to only 7 percent of them running Windows XP (the state-of-the art version). The unpopularity of Windows XP was partly due to its security problems, but partly because many consumers did not need to upgrade their system. To boost the sale of Windows XP, in January 2004 Microsoft stopped supporting Windows 98 (see www.msdn.microsoft.com). This policy may not affect individual users who still keep a backup copy of Windows 98. However, it has urged corporate users to switch, because the latter would not risk using a product not supported by warranties and after-sale services. Microsoft has also announced that it will withdraw other lucrative software (Windows NT.4, SQL Server 7 and Office 2000) from distribution and after-sale services in 2004.

Such an action forces oldsters to upgrade continuously. Many corporate PC users, such as law firms, public office or schools need software only for word processing, email communication and Internet access. However, if they stay with version 1, skip versions 2, 3 and then adopt version 4, the incumbent may modify version 4 based on the data format associated with versions 2 and 3, which are non-existent in version 1. Consequently, the data formatted in version 1 would be incompatible with version 4 if versions 2 or 3 have not been installed. Consequently, consumers who do not upgrade or who randomly upgrade may suffer from the lack of forward compatibility (see e.g., Lohr, 2001b). Again, this tactic is possible because the switching costs between the incumbent's and the competitor's product (e.g., Windows 98 and Linux) are higher than the switching costs between two incumbent's products (e.g., Windows 98 and Windows XP).

Not only consumers but also software developers are affected by forced upgrade. When the incumbent decides to release a new version of software, downstream or upstream software producers must quickly issue upgraded versions of their products to ensure they will be (again) compatible with the new mainstream product (see *Microsoft Europe Decision*, para. 681, on the compatibility between Novell server OS and Microsoft's 'Multiple UNC Provider').

The solution for the forced upgrade problem would be to allow the disadvantaged product to access the necessary MIEs, if technologically feasible, in order to reduce the advantages of the upgraded product solely on the ground of compatibility. As such, the consumer will not have to take into account switching costs due to incompatibility before making their choice, and software developers will compete only on merits.

A possible counter-argument against the above recommendation is the ‘durability’ of software. As software is durable, forced upgrade and withdrawal of supportive services are necessary measures. If the consumers refuse to switch until revolutionary technology arrives, the software developers would lack funding for R&D effort and so revolutionary technology will never arrive. However, this argument has been rejected in section 1.2.2(b) above. With security vulnerability and virus intrusion, the life of a software program ends when the software developer no longer provides after-sale services for this program. In addition, there are other methods to attract consumer demand on new products without forced upgrades. For example, if upgraded software versions were pre-installed on the new PCs, the consumers would obviously opt for upgraded versions any time they buy new PCs. As the price of PCs keeps decreasing, the prospectus of introducing new versions of software without forced upgrade or inefficient switching is feasible.¹⁷⁰ The issue is not whether an upgrade is efficient, but whether consumers have a choice. As long as they have, undertakings will compete on the merits and bring about allocative efficiency (see section 1.2.1).

b. Inefficient switching

A scenario similar to forced upgrade is inefficient switching, by hindering the interoperability between products at different levels, so that the consumers will buy the incumbent’s product in both the upstream and downstream markets. An example of inefficient switching is *Microsoft Europe*. In this case, the MIEs are the application programming interfaces (APIs) that link Microsoft’s desktop OS Windows with server OSs. The European

¹⁷⁰ Stevenson, R. “Bill Gates: Hardware to be nearly free in 10 years” *Reuters* 29 Mar. 2004. This article also highlights security as the top concern of software developer. As such, software is not a durable good.

Commission started investigating Microsoft in December 1998, following a complaint from Sun Microsystems. The latter alleged that Microsoft refused to provide it with necessary application programming interfaces (APIs) in Windows 98 (“Windows”). As a result, Sun server OS had greater difficulties in performing some features with greater difficulties than Microsoft’s Windows NT, such as printing or file synchronisation (“NT”, see *Microsoft Europe Decision*, paras. 252-279). The disutility of Sun server OS has widened the surplus ΔU in favour of NT without increasing its utility on the merits (*id.*, paras. 167, 641-646, and 695).

Can switching costs explain consumer detriment in the interoperability question? Can we say that by creating incompatibility between Windows and rival server OSs, Microsoft has denied a reasonable demand of server users? To answer these questions, it is necessary to consider the worldwide server OS market. The three major servers OSs are UNIX, Linux and NT. UNIX is the oldest server OS, although it is still supported by Sun Microsystem. Their users eventually will switch to either Linux or NT. Most servers, regardless of their OS, support PCs that run Windows as the desktop OS. UNIX users will have to choose: switch to NT or switch to Linux, without changing the software programs they are using at the desktop level (Windows). Another option -- switch to Linux at both levels, server and desktop, is infeasible because switching costs would be prohibitive (see Gartner Dataquest, 2003; *Microsoft Europe Decision*, paras. 83-106 and 596).

If we compare Linux and Microsoft in terms of price, quality and security, and come to a conclusion that a reasonable server user would have chosen Linux but for the incompatibility problem, then this incompatibility has created a force equivalent to parameter S in Figure 17 (section 3.3.5 above). In this Figure, we can denote U_1 as the utility surplus between NT and UNIX, without taking into account factors stemming from system compatibility between Windows and NT. U_2 represents the utility surplus between Linux and UNIX. From Formula (2) [$S > \Delta U$], we can conclude that the higher the incompatibility between Linux and Microsoft’s desktop programs, the higher S , and the higher U_2 that Linux must provide in order to offset the switching costs (see also section 3.3.2). By raising S , Microsoft has created a gap $\Delta U = S$ that it can exploit. Absent any evidence on competition on the merits, the market share

of NT grew from 25 percent in 1996 to 65 percent in 2002 (*Microsoft Europe Decision*, paras. 591, 592); and Microsoft has gained a profit margin at a very high level (50 percent; *id.*, para. 611).

The statistic from Gartner Dataquest (2004) shows that a switch from UNIX to Linux would have cost the users less than an equivalent switch from UNIX to NT, due to the similarity between UNIX and Linux.¹⁷¹ Amazon.com has reportedly saved \$15 million upon switching from UNIX to Linux (*CNet News* 30 Oct. 2001). A survey among network management experts at 107 companies, which use 1.2 million PCs, also confirms that Linux is superior to NT in terms of scientific engineering, security, and web serving (*Microsoft Europe Decision*, paras. 650, 699). However, these sources also admit that the NT environment can allow their Microsoft applications to print and share files faster than they are on the Linux environment, due to the incompatibility barrier erected by Microsoft. As such, consumers who need server OSs primarily for sharing files and printing had not switched to Linux (*id.*, paras. 598, 599). In addition, the more the Microsoft applications, the higher the switching costs (*id.*, para. 516). This proves the equation raised in section 3.3.2.b: *network effects + incompatibility = switching costs*.

The consumers who suffer detriment in Microsoft's incompatibility tactic are the customers of Microsoft software at the desktop levels (*id.*, para. 664). They have suffered detriment not because Linux does not provide a better performance than NT, but because they had bought Windows and other Microsoft applications. These purchases prevent them from using non-NT server OS, in the same way as the purchase of equipment prevents the equipment users from using repairmen services from a third party (see *Hugin* [1979] ECR 1869, *British Leyland v Armstrong* [1986] 2 WLR 400 and *Kodak* [1992] 504 US 451). The Courts in these cases held that the equipment purchasers had a right to choose their after-sale service providers (see *Hugin*:

¹⁷¹ See *WSJ Europe* 5 Apr. 2004: A1.

para. 6).¹⁷² Likewise, Windows' users have the right to choose the server OS they desire. Without accessing the necessary APIs, Linux OSs, although better than NT in terms of security ($U_{\text{Linux}} > U_{\text{Windows}}$), cannot serve Microsoft's customers in the desktop's market to the extent that Microsoft customers would expect. Consumer detriment is evident. Like *Hugin* and *Kodak*, the solution for the incompatibility problem would be to order Microsoft to grant necessary APIs licenses to Linux server OS providers (Microsoft Europe Decision, Art. 5).

Against the Commission's Decision, Microsoft (2004) argues that it has the right to license its intellectual properties to whomever it prefers. Similarly, it has the right to treat its product (Windows NT) better than rival products (IBM and Novell) in terms of access to its APIs (*id*, paras. 710 and 716). If we refer to a US case law, in *Verizon* (judgement dated 13 January 2004, section III), Justice Scalia held that access to the MIEs is granted when there is no access, not when such access is inadequate or discriminatory.¹⁷³ The server OSs of IBM or Novell can access Windows; they are only less compatible with Windows than NT. Microsoft's argument cannot be accepted if we look at the detriment to consumers. A requirement of seamless interaction between competitors' server OSs and Microsoft's desktop programs is a legitimate requirement of Microsoft's Windows customers. Moreover, Microsoft's argument does not show that the detriment to Windows customers who bought Linux server OS is a necessary sacrifice in exchange for a consumer benefit. As such, Microsoft fails to prove the three generic questions of consumer welfare (section 3.1.1 above). Microsoft's supporters can argue that such a detriment is an incentive for rival server OS to innovate and offset it. However, to accept this argument would be equivalent to giving the incumbent a green light for not only rising switching costs but also any abusive practices, including price increase.

¹⁷² In *Hugin*, the incumbent (Hugin) has almost been held abusive for tying service with equipment purchase. However, it has escaped punishment by showing that it did not hold a dominant position in the market for equipment (similar to *Kodak*).

¹⁷³ In *Northern Pacific Ry. Co. v United States* (1958) 356 US 1 and *American Key Corp.*, 762 F.2d: 1578, Justice Scalia also ruled that antitrust law does not compel a company to do business with anyone.

4.3 BUNDLING AND THE DETRIMENT TO CONSUMERS

Bundling is an integration of different products into one package. Bundling a product ‘by default’ into a dominant product may create an equivalent effect to refusal to license – a leverage of market power. US antitrust law considers bundling of a non-dominant market into a monopolistic market as a specific type of leveraging (see section 1.5.2). Bundled pricing is unlawful if an equally efficient rival could not profitably make consumers an offer they would accept (Werden, 2004, citing *SmithKline v Eli Lilly* [1978] 575 F.2d 1056). European competition law considers bundling a specific case of tie-in, an infringement of Article 82(d) EC: “[Arrangements] which, *by their nature or commercial usage*, have no connection with the nature [of the transaction, could be abusive].” Moreover, in *Tetra Pak II* [1996] ECR I-5951, the ECJ went further than Article 82(d) EC: “*even* where tied sales of two products are in accordance with commercial usage or there is a natural link between the two products in question, such sales may constitute abuse [...] unless they are objectively justified” (para. 37). The reason is that a ‘customary’ bundling tactic is only legal where undertakings have approximately equal bargaining powers (*id*, see also OECD, 1999a: 178).

However, the weakness of tie-in and bundling is that they do not show consumer detriment (see e.g., Lopatka and Page, 2001: 851). The objective of this section is to show the relationship between the bundling tactic, raising switching costs and consumer detriment in *Microsoft Europe*.

4.3.1 THE BUNDLING QUESTION IN *MICROSOFT EUROPE*

a. The history of the claim

A media player is a small application used for playing and managing audio and video files. A ‘professional’ version of the media player can also transfer (‘rip’) music or pictures into digital media, and copy (‘burn’) digital media into discs. The media content accepted by media players is formatted either in public standards, such as *.mp3*, *.mpga*, *.m3u*, *.mpeg*, *.mpg*, *.mpa*,

.mpga, *.avi*, *.au*, *.aiff*, *.aif*,¹⁷⁴ or in private codecs and formats, such as *.wmv*, *.wm*, *.wma* and *.asf* (of Microsoft), *.ra*, *.rms*, *.mna*, *.mns*, *.rmx*, *.rmj* and *.ram* (of RealNetwork), and *.mov* and *.qt* (of QuickTime, Apple). An ex-Microsoft employee, Robert Gasler, developed one of the first media players in 1992. In 1995, he found RealNetworks, Inc. (see <<http://www.real.com>>). Following Real Networks, Apple and Microsoft have also built their own media players, such as iTunes, QuickTime and Windows Media Player (WMP), apart from the products of other developers, such as Winamp of Nullsoft or Jukebox of MusicMatch.

The bundling question for *Microsoft Europe* came in early 2003, together with the Computer and Communication Industries Association (CCIA) complaining that Microsoft has bundled WMP into Windows by default. As almost all PC users have become Microsoft's customers and have been offered WMP, this tactic eliminates all competition in the downstream market for media players.

b. The consumers at stake

As argued in 3.1.1, the consumers are both the individual users and corporate users, whose interests are dependent on the MIEs and do not compete directly with the incumbent. The elements that can become MIEs in the dispute are the APIs, which connect Windows with a media player and the codecs and formats that allow digital media to rip, play and burn in a standardised media player. The relevant consumers are:

- The original equipment manufacturers (OEMs), which needs the MIEs (in this case, the APIs) to bundle media players into Windows, according to the PC users' request.
- The home and corporate PC users, who need access to the APIs to install media players into their PCs.

¹⁷⁴ MP3 stands for Moving Picture Expert Group, Audio Layer III. This compression format, developed by the Fraunhofer Institut in Germany in 1989, can shrink audio files with minimal quality sacrifices.

- The media content providers, such as universities, broadcasters of radio and television, music and the movie industries. These users also need the APIs, so that their media players can 'rip' their speech, music or movie into digital contents.

The interests of the OEMs, the PC users and the content providers are mutually dependent. For example, if PC users want to view a film or listen to a radio that is only available on the RealOne formats and codecs (*.ra* or *.rv*), they must install RealOne, regardless of their choice. Similarly, the OEMs would not install WMP by default if the PC users would appreciate RealOne more. However, if all the PCs are installed with WMP, then the content providers only support WMP not RealOne. Consequently, the PC users no longer require RealOne. Hence, among the three consumers, the choice of the OEMs and the content providers will dictate the choice of the PC users.

4.3.2 THE ARGUMENTS FOR BUNDLING BY DEFAULT

Microsoft (2004: 4) argues that its bundling tactic is a tried and tested business method that responded to consumer demand. Had the Commission conducted a survey as to whether the consumers preferred an operating system without a media player to an operating system with a media player, the answer would be predictable: the consumers would like to have a bundled product (*id*: 5). The bundled product not only helps them to access digital media on the Internet, but also save time and efforts for the consumers to search for a media player when they need one. The bundling practice would undoubtedly foreclose competitors, but it is only a side effect; its harm to society is smaller than the benefits that bundling can bring to consumers. In addition, even if the market became monopolised because of bundling, the monopolist would still innovate and thus the consumers would still receive benefit. Microsoft invested more R&D than any other software developers (US\$5 billion in 2001, see Bulkeley, 2003). Such a large R&D budget must have brought some benefits to the consumers. Overall, Microsoft's arguments aim at consumer welfare. Microsoft did not deny that its practices might create difficulties for a rival to compete, but equally their practices also brought consumer benefits.

Admittedly, rivals' innovation can be stifled, but the innovation process of society would not be retarded.¹⁷⁵

One may argue that in the long-term, consumers will always suffer detriment when a market is controlled by a monopoly firm, because price will increase. This assumption is doubtful in the market for public goods. In the past, the two basic questions for each producer before entering a market were: how many units of products he could produce (Q) and at what price (P), so that he could cover the costs and gain profits (see Figure 6). In a market for public goods such as software, the marginal cost is small, therefore the above two questions now became one: how to enlarge the quantity of units sold. The answer is: *low price* and *exploitation of network effects*. The second factor relates to the bundling practice.

Microsoft has exercised bundling and denial of interoperability in several occasions, most notably in its foreclosure of Netscape, the pioneer Internet browser. In *US v Microsoft* [1999] 165 F.3d 952, the Court of the District of Columbia predicted that as Microsoft's browser, Internet Explorer ('IE') became a 'de facto' standard, its price would increase, or innovation in the browser market would be retarded. This prediction has not been proved. To date IE is still freely available for all PC users and freely accessible for all Internet content providers. The innovation in IE has not been impressive, but neither was the innovation in Netscape, Opera or any other browsers. What is more, bundling has become a popular practice of not only Microsoft but also RealNetworks and other software developers. The Cicero's question – *cui bono* (who will benefit [from the decision]?) is still unanswered.

¹⁷⁵ The IBM settlement ([1981] ECR 263) is an example. IBM had dominated PC technology at the time. Both the US Federal Trade Commission (FTC) and the European Commission condemned IBM for the delay in disclosing important interfaces to competitors. Following a settlement with the Commission before the ECJ, IBM has agreed to release its System-370 interfaces until 1995 to competitors, including Bull and Olivetti in Europe (see *IBM Decision* [1984] 2 CMLR 342). However, the latter never become more innovative than IBM or Intel (See Katz and Shapiro, 1999: 29-30; Anderman, 1998: 199).

4.3.3 THE ECONOMIC SENSE OF BUNDLING

We need to accept that bundling is a useful practice, even if such a practice is a ‘bundling by default’. Consumer demand for bundling does exist, and bundling helps reducing transaction costs for the consumers. But bundling does not only provide consumers benefits. It gives rise to consumer detriment as well. When that is the case, the objective of the law should be to minimize the detrimental impact without losing the benefit of bundling. To reach this conclusion, this section looks into the following issues: (1) what are the economic objectives of bundling, and (2) whether these objectives necessarily give rise to consumer detriment.

Although bundling may arguably bring benefits to the consumers, it seems hard for conventional thinking to reason why software developers are willing to give software away. RealNetworks had even tipped the original equipment manufacturers (OEMs) or broadband developers to give away its software (*Microsoft Europe Decision*, para. 856). These facts seem to contradict the basic economic assumptions of ‘no free lunch’ and that economic players always maximize their profits. Both Microsoft and the Commission did not answer this question. Microsoft insisted that bundling was good for the consumers, without explaining why bundling was good for its business. The Commission pointed out that Microsoft’s motivation in bundling was to eliminate competition, but it does not explain why RealNetworks and other software developers also want to bundle their products into Windows, knowing that they could not eliminate the competition from Microsoft by this method.

One explanation of bundling is to make Windows become more attractive compared to other desktop operating systems such as Linux or OS/2. By that logic however, we would be forced to conclude that Microsoft has overcharged its customers for Windows in the past (and now must bundle WMP in lieu of reducing prices). Even if we do not make such an assumption, we cannot explain why Microsoft would not allow RealOne to be bundled into Windows, since RealOne will bring benefits to Windows, too. If Microsoft insists on discouraging rival media players to be bundled into Windows, the explanation ‘bundling WMP in order to bring benefits to Windows’, or similarly ‘WMP is a part of Windows’ should be rejected.

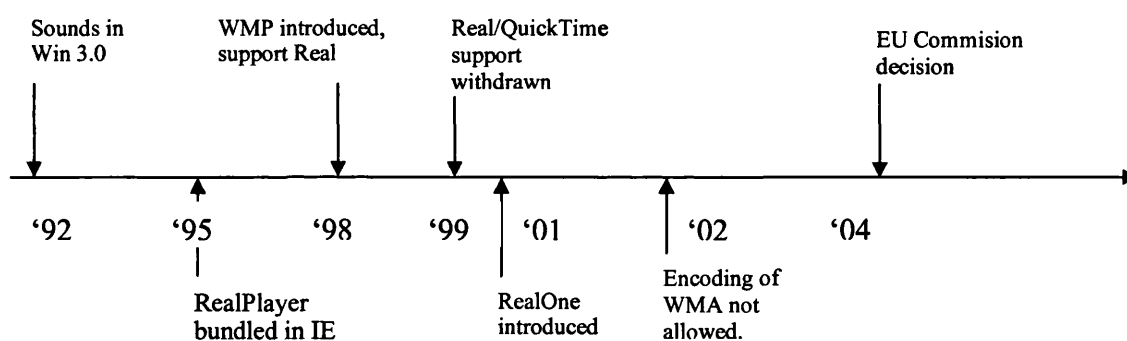
Another explanation of bundling is not about bringing benefits to Windows, but to solicit revenues from additional sources. Many software programs for software formats requires WMP as a platform, including Windows Media Services, Windows Media Audio (WMA) and Video (WMV), Windows Digital Rights Management, Windows Media Software Development Kit. Windows Media Consumer Electronics Leadership Fact sheets (in www.microsoft.com) in 2004 notes that: “adoption of Windows Media by the consumer electronics industries exploded in 2003, growing more than 150 percent with more than 500 devices now supporting WMA and WMV”. In addition, “WMA offers the largest installed base of secure music players in the world (three times the size of Apple’s iPod).” Hence, the motivation ‘bundling in order to solicit further investments in WMA and WMV’ aims at exploiting the vertical and horizontal network effects surrounding WMP.

Exploitation of network effects is not unusual or anticompetitive. But this does not explain why Microsoft would not allow RealNetworks to be bundled into Windows by default, since RealNetworks also support WMA and WMV formats and codecs. There must be an additional motivation for Microsoft to bundle its products into Windows. The additional motivation, for which I argue, is the accumulation of switching costs following the formula in section 3.3.2.b: *network effects + incompatibility = switching costs*. In the timeline below, we can see that Microsoft’s bundling tactic is aiming at creating incompatibility between the technologies of Microsoft and that of rivals (Microsoft Decision, para. 305-312). The first version of Microsoft’s NetShow Player (1998) supported RealAudio, RealVideo and QuickTime formats. Further in the past, Microsoft integrated the media playback functionality into its Windows 3.0 in 1992 (Microsoft, 2004: 6). At the time, media player was not considered as a product market, as consumer demand for this product was not yet emerged.¹⁷⁶ In August 1999, Microsoft released the Windows Media Technologies 4 architecture and no longer supported RealNetworks’ or QuickTime’s formats. From this time on, Microsoft has constantly added on extra functions, including Media Format, Media Rights Manager, Media Encoder and Media SDK. Later, WMP 8 no longer provided support for native MP3 ripping (*Microsoft Europe*

¹⁷⁶ The test of what constitutes a separate market is based on whether the consumer demand is considerable and specific enough to constitute a market (see *Hugin*, para. 5 and *Magill*, para. 52).

Decision, paras. 313, 898). On the contrary, RealOne has always supported WMA formats (paras. 132, 139). Step-by-step, Microsoft has pushed RealOne from being the first mover in the market to a lower position than WMP. At the same time, by promoting only WMA and WMV, Microsoft started diluting the market for media contents with its formats and codecs, pushing away the formats and codecs of rivals, even in the original MP3 format. As consumers started ripping digital media into Microsoft's formats, they have been accumulating potential switching costs that would occur if, any time in the future, they want to replace WMA and WMV with another format.

Table 5: WMP bundling timeline



The method by which switching costs have been accumulated in the media market is very similar to the method by which switching costs have been accumulated in the market for desktop OSs and server OSs (see Table 6 below). By doing so, consumers have to choose a sub-optimal product. This assessment highlights the hypothesis in section 1.5.2 that tie-in and refusal to license are two sides of the same coin: leverage of market power.

Table 6: the Microsoft investigation in Europe

<i>Markets</i>	<i>Major products</i>	<i>Indirect switching costs</i>
<i>Downstream market for media player</i>	WMP (80% of the market), iTunes and Real One.	Media contents (films, music) that can play online in a particular format.
<i>Market for desktop</i>	<u>Microsoft Windows (more than</u>	Contents, software and the PC hardware

<i>operating system (O/S)</i>	95% of the market).	those are only compatible with Windows.
<i>Upstream market for server operating system</i>	Windows NT (65%), Sun Solaris, IBM, Novell, Apache, Linux.	Software and hardware that are only compatible with a specific server O/S.

4.3.4 DETRIMENT TO CONSUMERS FROM BUNDLING

a. Competition on the merits and detriment to consumers

Is WMP a sub-optimal product, compared to RealOne? Different surveys show different results. In 2002, Microsoft claimed that its WMP 9.0 provided more functions than other media players.¹⁷⁷ However, Graven and Roubini (2003) assert that RealOne and Jukebox outperformed WMP, in terms of ‘ripping’ and ‘burning’ compact discs. RealOne is not only more format-tolerant than WMP, but also can rip a CD to Real format faster than WMP 9 rips it to WMA format, regardless of bit rate. According to the survey of the Commission, RealOne has been voted as the best media players in the market eight times, whereas WMP has been voted only twice (*Microsoft Europe Decision*, para. 947).¹⁷⁸ Thus, in terms of competition on the merits, the choice of WMP is a sub-optimal one ($U_{WMP} < U_{Real}$, *id.*, paras. 947-951). If consumers are forced to choose WMP, they are suffering detriment.

If RealOne is better than WMP, Microsoft argued, consumers would have downloaded RealOne into their PCs in the matter of minutes. As disk space is enlarged, a six-megabyte program such as a media player would not affect the performance of a PC in a considerable manner. It cited that RealOne has also admitted that over 300 millions copies of its products have been downloaded since 1997 (Microsoft, 2004: 6).

¹⁷⁷ See < <http://www.microsoft.com/windowsxp/windowsmediaplayer/comparison.asp>>. The extra functions include mini-player mode, full-screen A/V control, auto file/folder monitoring, 20-bit HDCD playback, auto-info for tag matching. For comparison with other products, see <<http://www.musicmatch.com>>, <<http://www.real.com>>, <<http://www.apple.com/quicktime>> and <<http://www.winamp.com>>.

¹⁷⁸ Review from USA Today “Comparing the big 3 Players” 16 Nov. 2003 show that RealOne outperforms WMP in terms of portability and system compatibility, see <<http://www.usatoday.com>>.

The 'free download' argument, though forceful as it seems to be, should be rejected in two grounds. First of all, the 'free download' solution may be correct for the home PC users, but not for the corporate PC users, whose download and self-installation are hindered by the company's firewalls (*Microsoft Europe Decision*: 862). If 'free download' were a viable solution, then in the browser market, many PC users would have downloaded and use Netscape, Mozilla or Opera as default browsers. In 2003 Opera was awarded by PCWorld and ZDNet as the most security-robust and best browser, on top of Internet Explorer (see <http://www.opera.com>). The reality is, in spite of complaints over security and user interfaces of Internet Explorer, most users still use it as the default browser. This is more ironic if we note that there is no switching costs issue in the browser market. It shows that just because a product is the best in the market, and it can be freely downloaded without suffering switching costs, does not mean that the consumers would have chosen it. For this argument to be correct, we would have to assume that all PC users are equally sophisticated and equally well-noted what product is the best in the market; an assumption that certainly none of us is willing to make. Moreover, as Justice Blackmun points out in *Kodak* (at para. 35), "the sophisticated [customers] will be unable to prevent the exploitation of the uninformed."

The number of downloaded software is irrelevant. A piece of software can be automatically downloaded any time when the old version of the media player is online (through screen prompt, see *Microsoft Europe Decision*, para. 865). Moreover, downloading a program does not mean that such a program will be used (*id*, para. 920). In any PC, as long as WMP is not deleted, it will run as the default media player unless the users change configuration, a task that not all PC users know how to do.

The number of downloads is also meaningless because the PC users are not the one who will decide what media formats and media players will be used. The choice of codecs and formats by the media content providers will indirectly suggest to the PC users the best media players to run. If the media content providers support WMA and WMV codecs, then the best media player to run them would obviously be WMP. In turn, the media content providers would support not the best media player in the market, but the ubiquitous one; which they know is available in any PC or any media device (*Microsoft Europe Decision*, paras. 884-887). The

choice of the content media players is simple: they will support WMP, and perhaps iTunes (for the customers of Apple customers). If RealNetworks do not develop any media receivers such as PCs (controlled by either Microsoft or Apple), iPod (controlled by Apple) or mobile phones, they will lose support of the media content providers in the long run. In other words, the choice of the media receivers decides the choice of the media content providers, who will determine the choice for the PC users.

We can explain this situation by Pinching Theorem:¹⁷⁹ let $g(x) \leq f(x) \leq h(x)$, for all x in some open interval containing a . If: $\lim_{x \rightarrow a} g(x) = \lim_{s \rightarrow a} h(x) = L$ then $\lim_{s \rightarrow a} f(x) = L$.

Let $g(x)$ be the choice of the OEMs, $f(x)$ be the choice of the PC users, $h(x)$ be the choice of the media content providers, and L be the choice of WMP. By the Pinching theorem, if the choices of both the OEMs and the media content providers are converged to WMP, then the choice of the PC users will be so converged, regardless of whether they have downloaded other media players in the past. Moreover, WMP has been installed by default since 1999 into Windows 98SE. As PCs are replaced every three to five years, most of PCs nowadays have been produced *after* 1999. This means almost all PCs in the world have already had WMP if they use Windows 98SE and the later versions.¹⁸⁰

In short, the incompatibility between WMP and the rival formats, and the ubiquity of WMP in the PC market have led the PC users and the content providers choose sub-optimal product and suffer detriment. In the long-term, such detriment will exacerbate, as the amount of media contents formatted by Microsoft's codecs increase, rising switching costs in favour of Microsoft's products.

¹⁷⁹ See Weinstein, D. (1999) Pinching theorem, in <http://mathworld.wolfram.com/PinchingTheorem.html>.

¹⁸⁰ Even the PCs manufactured before 1999 would unlikely run earlier OS than Windows 98SE. This is because these earlier versions are no longer supported by Microsoft, and none of the devices produced recently, from CD-Drive, digital camera, UPS memory stick to broadband modem would support versions older than Windows 98SE. One can say that all Windows-installed PCs nowadays have WMP in them.

b. Detriment to the consumers when WMP is the best product in the market

Will the conclusion become different, if WMP, instead of RealOne, is the best product in the market? In this case, we cannot argue that the choice of the content providers and the PC users are sub-optimal. However, the presumed superior quality of WMP does not mean that Microsoft's bundling tactic only benefits consumers. It should be noted that the bundling practice in this case is a combination between monopoly power in the upstream market and the incompatibility between Microsoft's formats and rival formats. This results in detriment to the owners of the media contents using other formats. They would have to incur switching costs, at least in the time spent for converting rival formats into Microsoft's formats. One can argue that these switching costs are necessary, similar to the loss of the Betamax videocassettes when VHS videocassettes prevail. This is not correct. The loss of Betamax videocassettes occurred because it would have been inefficient to produce a videocassette recorder (VCR) that supported both the Betamax and the VHS standards. It would mean to produce two VCRs. The loss of system incompatibility should be acceptable only when it is unavoidable (see section 2.1 above). Software is liquid (see section 1.3.1.c). In the case of media players, RealOne has proved that it can support many formats and save consumers switching costs.

To show the impact of unnecessary switching costs from system incompatibility, we can study the case of RealNetworks. With respect to the music subscription market, RealNetworks by 2003 has attracted 350,000 subscribers to its music subscription services, with 48 million songs monthly streamed to these subscribers (see Lohr, 2004). Similarly, since 2003 Apple has sold 70 million songs in its formats to play with iPod, a music portable device, for 99 cents per song (*NY Times* 29 Apr. 2004). Should iPod users want to listen to music on their PCs, they would have to convert or rip their songs they have purchased into Windows formats, incurring extra switching costs. Likewise, RealOne is installed in more than seven million mobile phones worldwide (Zelos Group and Envisioneering; see Lohr, 2004). Consequently, if WMA and WMV prevail in the PC market as the central library of multimedia, mobile users must convert their files and replace media players in their mobile devices to be compatible with those stored in the PC, incurring further switching costs.

Finally, if Microsoft thinks of promoting consumer welfare as it claims to, it would not object the request of the Commission to allow rival products to be bundled into Windows. The integration of RealOne into Windows would also make PCs more attractive and easier for the consumers to use. This is even more so because RealOne is more format-tolerant than WMP.

c. Bundling by default and harmful effects to competitors' innovation

When WMP becomes ubiquitous and gain almost all support from consumers, rival media players cannot innovate to become better than WMP. This gives rise to a 'chicken and egg' dilemma: if there is no initial purchase, Microsoft's competitors will be short of funds for further innovation.¹⁸¹ In the end, rival media players will disappear from the market, in the same manner as Netscape, Lotus 1-2-3, WordPerfect, O/S 2 and other products rivalling Microsoft have disappeared. Fischer and Rubinfeld (2001: 57) demonstrate that the failure of Netscape is a credible threat to other innovators. The threat is that although Microsoft is not the first mover, it is always the standard setter, thanks to the bundling practice. It will paralyse any incentive that governments or consumers try to provide innovators.

In the end, only when a market has been liberalised and consumers have been benefited from it could one see how much they had suffered in the past. The spin-off of American Telephone and Telegraph (AT&T) in 1982 is a good example. Before spin-off, AT&T argued that monopoly was important for a universal service sector, such as telecommunications, in order to exploit efficiently the 'economies of scale' and 'economies of scope'. It took a great courage for the FTC and DOJ to force AT&T to break up into four companies. After the spin-off, consumers benefited immediately and innovation flourished. As for AT&T, its tariffs decreased by 40 to 45 percent in 1980s, but its volume increased annually by 6.7 percent. Had the spin-off been delayed, consumers would have suffered more.¹⁸² A competitive market can

¹⁸¹ RealNetworks reported that it has lost US\$245 million in four years since 1998 (see Lohr, 2004).

¹⁸² FCC, *Statistics of Communications Common Carriers*, Washington DC 1991.

only lead to less innovation if the risks of sunk costs and free riding are too high. Bundling is not this case.¹⁸³ If the incumbent were concerned about sunk costs, it would not give away the bundled product.

4.3.5 THE TWO-VERSION MARKETING SOLUTION

When bundling implies both costs and benefits to the consumers, as seen in sections 4.3.2 and 4.3.3, the issue is not whether bundling is allocative efficient, but whether bundling is adopted under a compulsory or a voluntary basis. The answer is clear: consumers should have a choice, because only they can have enough information of their own business and can strike a balance between the costs and the benefits of having an extra free product. Consumers may still desire media players bundled into Windows, but not all of them will choose WMP if they have a choice. In *Hilti* [1990] ECR II-163 (para. 68) the CFI set a principle that a dominant firm is not allowed to take in its own hand what is good for the consumers.¹⁸⁴

In Article 6 of the *Microsoft Europe Decision*, the Commission announces that Microsoft's bundling tactic is anticompetitive and seeks a solution to rectify the unwarranted advantage of Microsoft in the market for media players. The firm will be ordered to market a version of Windows without WMP, in addition to the version that Microsoft currently markets (the "two versions solution"). The decision requires Microsoft to offer the original equipment manufacturers (OEMs, e.g., Dell, HP or Compaq) a version of Windows without WMP within 90 days. Consumers may still demand bundled products, but the OEMs and mobile phones manufacturers will play a proxy role for end-users. The proxies will decide which media player will be bundled into Windows. Between two alternatives, unbundled Windows and Windows

¹⁸³ Upon being informed that the Commission will rule against Microsoft, venture capital funds have increased their investment in Microsoft's rivals, hoping for new market opportunities, see Thomson, V. (2004) "VCs fund open-source software" *TheDeal.com*, 18 Mar. 2004.

¹⁸⁴ Hilti has tied users of its patented cartridges with purchasing its nails. It has alleged that the tie-in is objectively justifiable as it was necessary to maintain standards. The Commission and the CFI have rejected this argument, on the grounds that Hilti cannot decide issues reserved to legislation, see *Whish* (2001: 609).

bundled with WMP, the OEMs will decide whether they will bundle WMP or RealOne into Windows, based on the products' quality and performance.

The whole point of the Decision is to prevent Microsoft from dominating the data formats of digital contents without competition on the merits. A solution to this problem is either to create competition among media player products as the Commission ordered. Another alternative is to request WMP to support rival data formats, in the same manner as RealOne does. As such, competition on the merits in the field of data formats would take place.

One may ask: bundling has its positive and negative effects, but other practices of product promotion also face the same problem, why should the law treat bundling more severely? Why should the law not compare between the benefits and the costs of bundling? These questions seem convincing, but they are irrelevant. A balance between costs and benefits is necessary only when there is a choice to make between bundling and unbundling. This is not the case. The incumbent still has the right to bundle its product. What he could not do is to bundle its product 'by default', without giving the consumers or the OEMs an option to support the rival downstream product. By allowing bundling on a voluntary basis, the law does not forfeit the benefits that bundling may yield, it only minimises the detriments that bundling may cause.

Another may challenge: why should the Commission be concerned that Microsoft's competitors cannot create a revolutionary innovation that prevails over WMP? Netscape and RealOne were revolutionary products, but they are by no mean the only products of their kinds. Schumpeter's theory of creative destruction demonstrates that no monopoly can be safe for long (see section 1.2.1). This argument however misses the point. The Commission has challenged neither the Schumpeterian creative destruction, nor the low price of Microsoft's product. It aims at ensuring that competition on the merits and incremental innovation are not hindered by leveraging.

What is the difference between the Commission's decision and Microsoft's proposal, to allow RealOne and iTunes to be supplied with Windows?¹⁸⁵ From the outset, there is no difference. However, the distinction between supplying the users with a CD-R containing rival media players, and voluntary bundling for the OEMs, as the Commission decided, is evident. Microsoft's proposal is nothing but another attempt to control the OEMs, the crux of the dispute. OEM control is the foundation of almost all Microsoft's practices. In the past, many PCs were installed with two web browsers, Netscape and IE, but in the end, consumers need only one browser, because Microsoft has controlled the OEMs, the most important distribution channel. This control is different from Mediaprint control of a newspaper distribution channel in *Bronner* [1997] ECR I-7791. In the later case, Mediaprint is the owner of the distribution channel. In *Microsoft Europe*, Microsoft is not the owner of the OEMs, and as such, it cannot prohibit the OEMs from bundling the media players at their choice into Windows.

One may be concerned that by requiring the incumbent to provide two versions of software, its production costs will increase. Microsoft has used this argument to deny the court order to unbundle IE from Windows (see e.g., Binkley and Lohr, 2001; Creuss and Agustinoy, 2000: 66). However, if the rivals can market products separately, this argument does not bear a merit; and in any event, Microsoft can price their products differently to reflect the costs incurred. If Microsoft were concerned about the costs, it would not bundle WMP at no cost.

To conclude, Microsoft has little justification in terms of cost-benefit analysis; and there is no disadvantage of the two-version marketing solution for Microsoft's interests. The two-version solution gives the consumer more choices, which are crucial to create market opportunities and promote innovation. Moreover, consumers being the oldsters of rival

¹⁸⁵ See Dombey, D. "Microsoft in last ditch move to secure EU deal" *Financial Times* 17 Mar. 2004. Microsoft proposed that it will request all OEMs to include RealOne and iTunes on the hard discs of PCs. In addition, a third program (apart from WMP) would be designated by the OEMs themselves. In addition, a compact disc including RealOne and iTunes would be provided with PCs. OEMs worldwide will be asked to include three media player programs, as well as supplying a CD with additional programs. See also *NY Times* 21 Feb. 2004: "Europeans Reject Offer by Microsoft."

products can save their switching costs, and the youngsters do not have to take into account switching costs when they have to decide which products they will buy.

4.4 JOINT CONCLUSIONS OF CHAPTERS 3 AND 4: COMPETITION RULES AND THE REDUCTION OF SWITCHING COSTS

4.4.1 THE TWO-TIER APPROACH TO REDUCTION OF SWITCHING COSTS

It has been argued so far that in the non-innovative markets, a refusal to license an MIE is an abuse if (1) such a refusal has created an unsurpassable barrier to exit for consumers ($Min S > Max \Delta U$), and (2) there has been no justification for the refusal (see section 3.4). In the innovative markets, a refusal to license an MIE is in itself not an abusive practice, unless (1) the consumers suffer a direct detriment, as a result of exploitative conduct (price increases, price maintenance, forced upgrade and inefficient switching), or (2) the incumbent intentionally raise switching costs so that consumers must use sub-optimal product. These can be put into the following two-tier approach (Figure 18 below).

In the first step, the characteristic of the market will be ascertained. In the second step, different measures will apply depending on the type of the market. If the market is non-innovative, the focus is the formula $S > Max \Delta U$. A refusal to license per se without justification may amount to an abuse. If we refer to the S-C-P paradigm (Figure 4 above), this is a structural regulation. If the market is innovative, the focus is the relationship between the incumbent's conduct and the detriment to the consumer, either actual or probable. Under the S-C-P paradigm, this is a conduct regulation. In both cases, when we can confirm that consumers have suffered detriment, the final question is whether the incumbent could justify his conduct. Only when the answer is negative could we affirm the abuse.

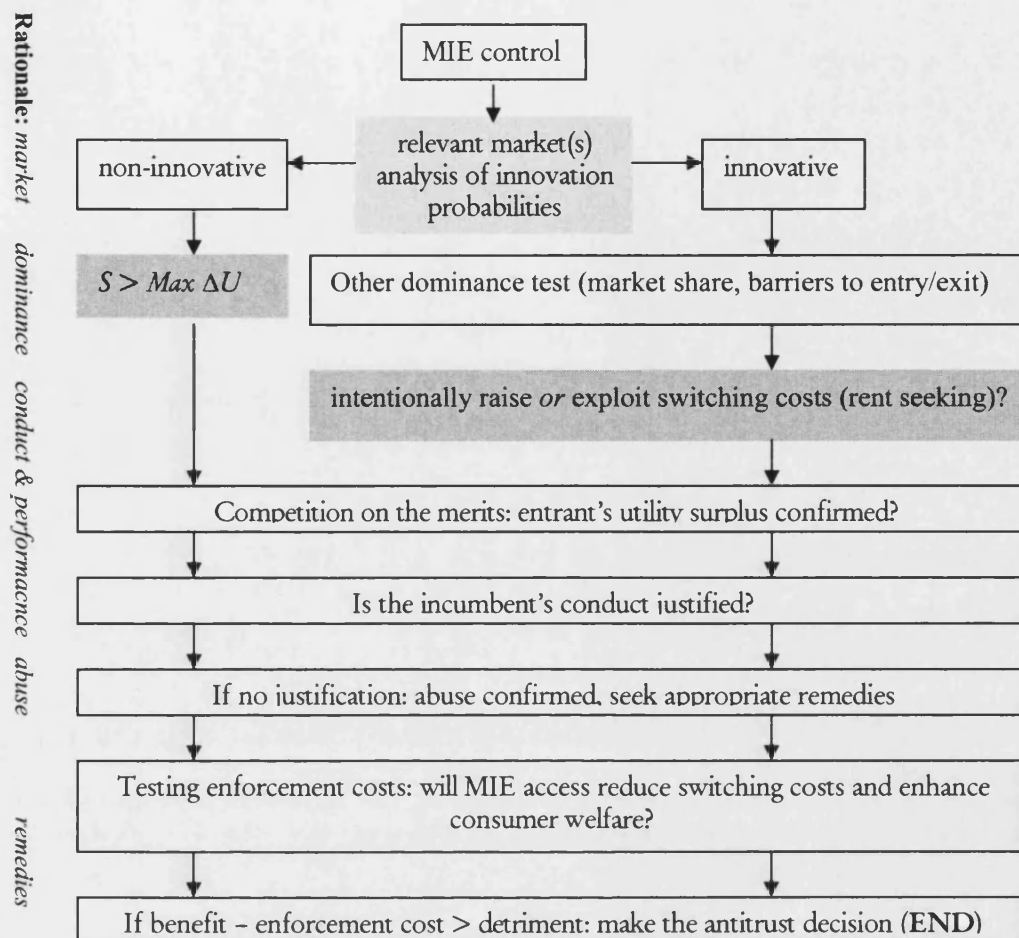


Figure 18: anti-competitive measures to reduce switching costs

The above issues are relevant in three practical circumstances: a copyright litigation, an administrative antitrust investigation or judicial competition litigation. In the first case, the court must be satisfied that the MIE exists and has caused incompatibility problems. In the second case, the competition authority must prove that a firm is raising switching costs before applying anti-abuse measures, such as the essential facilities doctrine (EFD).¹⁸⁶ In the third

¹⁸⁶ MIE is also a relevant issue with respect to merger and acquisition. In the merger between Boeing and Donnell McDouglas, the Commission has required the new entity grant licenses to its European competitors with respect to an infrastructural defence technology developed by Donnell McDouglas (OECD 2001a: 185).

case, the court must ascertain whether the case is about an abuse of the MIE to review a decision from a competition authority.

4.4.2 MARKET DEFINITION AND MIE CONTROL

The first step in the above two-tier approach is to identify the MIE and the relevant market, where the alleged abuse and the alleged consumer detriment took place. The complexity of the case will depend on whether the relevant market is an innovative or a non-innovative market. As discussed in sections 3.2.3 and 4.1.2, the key question in determining the character of a market is the consumer demand for innovation and the impact of consumer switching costs. This information may require various sources of investigation, such as quantitative tests, sales revenue observation, interviewing customers and competitors, marketing studies and consumer surveys (see *Market Notice*: paras. 25, 28-43). These methods, especially surveys, are expensive and may be biased by the hostile attitude towards monopolists and the desire for low-price products of the consumers. Therefore, they should be treated with care and should be conducted only after some preliminary assessments have been made.

a. Pre-survey assessments

The preliminary assessment includes the definition of consumers who have a specific demand for the element in dispute and the taxonomy of market. In a multi-layered market, one may have different consumers for different markets, as well as different types of consumers. For example, in *Microsoft Europe*, the consumers in the media player market are the media content providers at the upstream level, and the PC users at the downstream level (see section 4.3.1.b). Once the scope of consumers is limited, we can define the characteristics of the relevant market (non-innovative/innovative market). In some cases, the answer was evident (e.g., *Magill* or *Hugin*). In other cases we need to conduct surveys from the consumers, particularly when the innovativeness in the market depends on the switching costs incurred (e.g., *IMS*).

When the consumers and the relevant markets are defined, the competition authority will define their demand in the downstream market, the impact of switching costs in the upstream market on the demand in the downstream market, the relationship between access to the element in dispute and the reduction of switching costs. If the incumbent's conduct only creates detriment to consumers without giving them any benefits in exchange, such as unjustifiable price increase, the consumer detriment would be obvious. The survey result would be predictable and may be skipped. Otherwise, if the incumbent's product provides both benefits and costs to the consumer, judges should take these cases with extra care and surveys are worth carrying out .

b. Consumer surveys

When it is difficult to define the characteristics of the relevant markets and the consumer detriment, survey becomes necessary. The three relevant issues to identify in a survey will be the consumer's switching costs, the role of the MIE license (or other solution) in reducing these costs and the consumer's demand for alternative products given the size of switching costs (see *Market Notice*, para. 25, 28-43, and 3.3.3). These issues will identify whether the incumbent holds dominant position, whether the lack of MIE license is the main reason that prevents competition on the merits from taking place. With respect to the first issue, the question is how high the switching costs are if consumers (both the oldsters and the youngsters) replace the incumbent's product with the entrant's products. This question has been analysed in sections 3.3.1, 3.3.5 and 4.2.1.¹⁸⁷ With respect to the second issue, the question is whether from the consumers' viewpoint, utility can increase or switching costs can be subsidised without access to the disputed element. If the answer is negative, then the disputed elements are the MIEs. With respect to the third issue, the issue is whether consumers demand an improved product or the same product at a lower price. This question will decide whether the product market at dispute is an innovative market or a non-innovative market.

¹⁸⁷ Consumer survey has been used in the *IMS Health* Decision, see section 1.5.1(a), 3.3.3 and 4.1.1 above. After *IMS*, the Commission has applied the same method to assess the claim from the CCIA about Microsoft bundling its products (consumer interview and market survey, see Kanter 2003).

The problem with surveys is that they can be expensive, lengthy and biased. A survey of all PC users is impossible to carry out, and some respondents may answer the questions carelessly. These problems are profound, but they are only technical obstacles, not legal loopholes. Nowadays the competition authority can conduct surveys through e-mails or web sites. These methods could save time and money if the names of the respondents are identifiable. In addition, by using probability balancing (see section 4.1.1), the survey can concentrate on representative samples of the whole market. The survey carried out by the Commission in *Microsoft Europe* is a good example. To confirm the ubiquity of Microsoft's software in markets for server OS and media players, the Commission has conducted a survey among 107 companies on server software and 50 companies on audio-visual software. The companies responding to the media-players inquiries used 1.2 million PCs, representing a high level of consumption. The surveyed questions to the OEMs and the corporate users were how they viewed the technology they used to disseminate audio-visual materials over the Internet (demand-side substitutability), and how much they would need different media player software. The responses have highlighted that the ubiquity of WMP on PCs had artificially skewed the development incentive in favour of Microsoft software, instead of Microsoft's rival software, such as iTunes or RealOne.¹⁸⁸

4.4.3 REDUCTION OF SWITCHING COSTS

a. Reduction of switching costs in a non-innovative market

The relationship between a refusal to license and the formula $Min S > Max \Delta U$ is the core factor in establishing consumer detriment in a non-innovative market. The first step is to determine the utility surplus of the new product compared with the old one (ΔU), without taking

¹⁸⁸ Kanter (2003). See also *Microsoft Europe Decision*, paras. 883-890. The Commission has also received a similar response from the businesses around Europe regarding the abuse of Windows leverage to support NT, when it was asked whether the interoperability between servers and PCs was a major factor in their buying decisions (*id.*, paras. 383-386).

into account network effects or switching costs.¹⁸⁹ The court can appraise ΔU directly by the independent experts in the field of information system (see e.g., Ciborra, 2002; Hanseth, 2001), or indirectly through consumer surveys. As argued in section 3.5.3, the maximum level of utility surplus ($Max \Delta U$) is determinable when a market is non-innovative.

Together with confirming ΔU , the competition authority can estimate S , again through consumer surveys. These costs are expenditure incurred indirectly, in relation to the MIE. As discussed in section 3.5.2, some of these costs, particularly the transaction costs from system compatibility are measurable. If the market is non-innovative, S is larger than the short-term utility surplus $\Delta U (= U_2 - U_1)$, the driving forces to improve ΔU in the long run is weak (see section 3.4.3), and S will increase as the consumers keep investing in the old product, then in terms of probability S will be larger than ΔU in the long-term. Hence, reducing S , by a MIE license, is the preliminary condition for increasing ΔU in the market.

b. Reduction of switching costs in an innovative market

With respect to innovative markets, the relevant questions are whether (1) the incumbent has intentionally raised switching costs of the consumers, and (2) as a consequence, consumers have suffered a direct detriment and the net balance is a decrease of consumer welfare.

Proof of detriment requires active conduct to exploit the high switching costs in the market, and the detrimental reaction of consumers who ensue. These abuses could either be pricing or non-pricing practices. The first type includes an increase in prices or maintenance of high prices without justification (see section 4.2.1). The second type includes forced upgrade or inefficient switching by tactics that artificially promote incompatibility (see section 4.2.2).

¹⁸⁹ For consumer demand and abuse of copyright, see section 3.1.2. In *Ladbroke and Bronner* (in section 5.2 below), the ECJ have squashed the request of the plaintiff for applying the EFD on the ground that there is no proof that consumer demand for the dominant firm was not satisfied. See also Lang, J-T (2002).

With respect to bundling, the evidence of consumer detriment is based on the balance of costs and benefits between different solutions to create a level playing field between undertakings, so that competition on the merits can take place, rather than actual damages. Bundling by default *per se* could be pro-competitive. However, bundling to leverage monopoly power and solicit system incompatibility is not. As argued in section 4.3.3, depending on the market share of the bundled product, a competition authority may require the incumbent to offer two versions: bundled and unbundled products. This mandate has an equivalent effect as if the competitors were granted a *practical* MIE license so as they can compete and innovate in the downstream market.

4.4.4 THE AFTERMATH OF THE MIE LICENSE

Chapters 3 and 4 only analyse the relationship between consumer detriment and the dominant position of the incumbent. They have not taken into account the possible justifications for using positive externalities from switching costs, as well as whether the costs of a compulsory MIE license would exceed the benefits. The main question of this thesis has not been answered. Following Figure 18, until the incumbent fails to show that his conduct is justifiable to prevent some bigger risks to society, we cannot conclude that he has abused his dominant position. Coase (1960: 14) remarks:

“The problem ... in dealing with actions which have harmful effects is not simply one of restraining those responsible for them. What has to be decided is whether the gain from preventing the harm is greater than the loss which would be suffered elsewhere as a result of stopping the actions.”

As concluded in sections 1.2.2 and 2.1, there are two economic justifications for refusal to license, on the grounds of sunk cost recovery and free riding prevention. The primary issue is whether the rightholder (the incumbent) has sufficient incentives to innovate if he knows that after his product becomes an MIE, he must grant his competitors the MIE access (the entrants). Another issue is whether the entrant would have an incentive to innovate after being granted access if he knows that by doing so he may be later bound to grant access, when he develops another MIE.

CHAPTER V: SUNK COST AND FREE RIDING JUSTIFICATIONS

This chapter analyses the risks of sunk costs and free riding through four questions:

- (1) Are there other justifications for refusal to license or increasing switching costs, apart from sunk costs and free riding (section 5.1)?
- (2) For how long can the incumbent refuse to license (as a time incentive – section 5.2)?
- (3) If the risks of sunk costs and free riding can be recovered by monetary payment, how high the MIE access fee would be (the monetary incentives – section 5.3)?
- (4) Can we provide sufficient incentives in the aftermath of compulsory license, so that the incumbent and the entrant can continue innovating (section 5.4)?¹⁹⁰

Afterwards, the arguments in Chapters 3, 4 and 5 will be summarised by a procedure entitled the essentiality-justification mechanism (section 5.5). The issues presented in this chapter are focused on refusal to license, not bundling. If the incumbent is concerned about the recovery of sunk costs and the risks of free riding, then he should not bundle additional product into the platform free of charge. Admittedly, the incumbent can argue that without bundling, he cannot attract more consumers to the platform that could justify continuing innovation, but antitrust authorities do not prohibit bundling. They only prohibit an exclusive bundling into a

¹⁹⁰ By analogy, this structure follows the compulsory license scheme under Article 31 TRIPs. Although this scheme applies only to patent, it could give a useful lesson on how to provide a balance between the interests of the intellectual property rights holder and the public interests. Namely, a compulsory license can only be granted after three years (Article 31.2 TRIPs). The royalty for the license should be fair and reasonable (Article 31.3 TRIPs), and there must be a mechanism to guarantee that there are incentives to innovate after the license.

platform, which exclude a chance of other undertakings to compete on the merits and recover their own sunk costs.

The analysis of the MIE license is about the aftermath: what the entrant will do after obtaining the license, and what the incumbent will do in response to the entrant's strategy. To understand these effects, we must have some means of predicting behaviour through game theory. Game theory posits that, regardless of how people go about making decision, the actions they take are consistent with a few basic principles. According to the principle of strict dominant strategy, a player is likely to choose an action if that action leaves him better off than any other action would, regardless of what other players do (see e.g., Baird *et al.*, 1994: 271). A combination of different activities leads to a 'Nash equilibrium': an outcome when two dominant strategies interact is likely to be one in which no one can be better by choosing another option, given the actions others take. Our task is to design the law so that when the incumbent and the entrant play their dominant strategies and reach the Nash equilibrium, the outcome will be that the players will innovate and the consumers will benefit.

The impact of free riding on the incumbent's business is not the same at all times. For a complex issue, it is better to deal step-by-step: sunk costs recovery first, and prevention of free riders later. Westkamp (2000) demonstrates that when sunk costs are recovered, the incumbent is of no less advantaged position than the entrants. As he could compete with the entrants on a level playing field, the free riding risks would concern him less than if he must deal with two risks at the same time. Perhaps Chicago scholars Landes and Posner (1989: 362) can best describe this insight: "[there is] no benefit (yet potentially substantial costs) in perpetuating protection ... beyond [what is] necessary to recoup the fixed costs of creating the work. After that, it is fine to dump the copyrighted work into the public domain." What is more, usually the issue of free riding arises when the free riders take advantages of the incumbent's sunk costs (see e.g., Whish, 2001: 544). When the entrants share the R&D costs with the incumbent, they are no longer free riders. Landes and Posner (1989: 346) also note: "accidental/necessary copy does not involve free riding."

5.1 PRELIMINARY ISSUES OF SUNK COSTS AND FREE RIDING

Before analysing the risks of sunk costs and free riding, one could ask: (1) are they the only justifications possible for switching costs exploitation? (2) when do they become relevant? Concerning the first question (section 5.1.1), sunk costs and free riding are not only the common justifications, but also the only ones that could possibly be accepted for raising switching costs. Other arguments lack either a legal or an economic basis to become a serious challenge to the MIE compulsory license. The second question is discussed in section 5.1.2.

5.1.1 JUSTIFICATIONS FOR REFUSAL TO LICENSE

The first justification for refusal to license is that lock-in, bundling and refusal to license will enhance efficiency (see sections 1.3.2 and 4.3.3). The price of products sold in bundles could be lower than the individual products. There is also a potential of combining complementary R&D assets, in such a way as to make successful innovation more likely, to bring it about sooner, or to reduce R&D costs.¹⁹¹ However, even if this argument is true, using it to justify the refusal to license is irrelevant. As argued in section 4.3.3, the law does not prohibit the incumbent from exploiting market integration, including bundling, as long as the consumer has a freedom of choice. The law only prevents exclusive bundling and using high switching costs as an advantage in the downstream market.

The second justification for refusal to license is that the incumbent should recover not only the sunk costs but also the opportunity costs of a 'once-in-a-lifetime' success. Sutton (1998: 227) criticises that a grant of MIE access would give the entrants an opportunity to gain access to the market(s) that they otherwise would not have.¹⁹² In this vein, the incumbent should be entitled to charge the entrants a premium in exchange for the trading right. This argument also lack supportive legal basis. The incumbent has no vested power to grant a trading right, which

¹⁹¹ Evans, Nichols and Schmalensee (2001: 120), *IP Guidelines: 5-6, Media Market – Economics: 11, 123-24.*

¹⁹² Paying a premium for a commercial right is a common practice in the markets for taxicab (medallions), telephone (spectrum) or oil and gas; see Viscusi *et al.* (2001: 465-93, 520-25, 620-31).

is the power of the state;¹⁹³ and the State's obligation is not to give a 'once in a lifetime' opportunity to the incumbent, but to provide a sufficient innovation incentive.¹⁹⁴

Invoking a 'once-in-a-lifetime' success is similar to alleging: "we used to have monopoly power, and it is unfair that after licensing the entrant we need to compete with rival products." To this argument, AG Tizzano notes in the *IMS* opinion that even if a product competes with another product protected by intellectual property, the court would still support it, as far as it responds to a specific demand that the incumbent did not satisfy (para. 62).

The third justification is that the consumer detriment from switching costs will be offset by the benefit the incumbent will bring to the consumers. After bundling Internet Explorer with Windows, Microsoft has raised both costs and benefits to the consumers. This argument has been discussed in section 4.3.3. In any event, the 'offset' argument by itself does not show that the consumers should necessarily suffer the detriment. This argument must be combined with a proof that the risks of sunk costs are so high that the incumbent needs monopoly profits to recover them.

Jorde and Teece (1992: 47) offered the fourth justification, that the high price from monopoly is an incentive to spur innovation in a contestable market. However, if it were the case, innovative and low-priced office package software from IBM or Sun would have taken over Microsoft's Windows platform on the desktop PCs. This argument has not taken into account the consumers' switching costs. Therefore, it had not denied the consumer detriment discussed in Chapters 3 and 4.

¹⁹³ In *Victoria Park Racing v Taylors* [1937] 58 CLR 479, the defendant has built a high platform on his land that oversaw the plaintiff's spectacle, causing his loss of audience. The magistrate court stated that the defendant has "misappropriated ... something that the plaintiff has created." Later, the High Court of Australia rejected this decision, saying that there was no property right in the view of spectacle.

¹⁹⁴ I am indebted to Professor Dany Quah for this suggestion. Moreover, the incumbent's success is a combination of many factors, not only the incumbent's innovation but also the consumer's participation. Therefore granting the incumbent a exclusive right to exploit "once in a lifetime" opportunity on the sole ground that "it was theirs" is inadequate. See Warren-Boulton and Baseman (1995).

The fifth argument in favour of a refusal to license an MIE is that a reduction of switching costs will only harm the incumbent without giving them any benefit. This argument is doubtful. High switching costs may increase the incumbent's short-term profit, but they may harm his long-term development. That means the incumbent must invest in incompatible standards and becomes "too heavy to change" (Porter, 1980: 21). When his standard is surpassed by another standard, the situation is comparable to the collapse of a dam holding back the water of a reservoir. The market will soon become empty.¹⁹⁵ At any rate, when the risks of sunk cost and free riding are addressed adequately, the incumbent should receive a sufficient benefit to continue innovating. This benefit may not be as high as the monopolistic profits, but the aim of regulation is to provide sufficient innovation incentives, not to guarantee monopolistic yields.

The last possible justification for refusal to license, from Farrell and Klemperer (2001), is that an increase in switching costs by adding utility, such as loyalty programs for frequent flyers, might prevent the consumers from inefficient switching. As noted in section 3.3.1, I omit this argument because it is based on the definition of direct switching costs, whereas our discussion is focused on indirect switching costs. Moreover, the consumer should know better than the incumbent whether switching is efficient or inefficient. Even if he makes a mistake, he should have the right to do so. To say that the incumbent helps the consumer by preventing inefficient switching is to put the cart before the horse.

5.1.2 MARKET TAXONOMY AND THE INCUMBENT'S RISKS

Given that sunk costs and free riding could be the justifiable risks for a refusal to license, the next question is *when* they become relevant arguments. To answer this question we need to assess the risks in a specific market.¹⁹⁶ If the risks of sunk costs and free riding in a market are

¹⁹⁵ See Dedrick and Kraemer (1998: 72) for the failures of many IT standards, including J-DOS, Apple Macintosh, Lotus or Word Perfect.

¹⁹⁶ Risk is in priority of the author's concern. Cornish (1996: 320) said: "the very purpose of copyright protection is to allow recoupment for the initiative of creating the work and the investment risked in producing and marketing it."

small, copyright protection should not be used as a shield against competition law. In a non-innovative market, the demand for innovation is low by definition, so are the R&D costs and the risk of sunk costs from R&D. In innovative markets, the demand for innovation is high, so are the risks of R&D sunk costs.

With respect to the risk of free riding, it will depend on the motivation of innovation. The relevant question is: how probable is it that the incumbent will be less innovative because of the entrant's free riding? If innovation is purely profit-driven, then the impact of free riding on innovation will depend on whether the incumbent competed with the entrant. In *Magill* (see section 1.1.3), the incumbent is active in the upstream market (broadcasting services) and the entrant is active in the downstream market (television program guide). Even if the entrant could 'free ride' the incumbent's effort, this conduct does not affect the innovation incentives. As the incumbent must produce television programs in any event as a by-product, the impact of free riding may be low. In *IMS* (COMP D3/ 38.044: 120 and 128) however, the incumbent and the entrant are competing in the same market, the impact of free riding therefore is higher than in *Magill*. The taxonomy between competition and non-competition relationships could therefore be helpful in assessing the risks of free riding.

When markets are so subdivided, the cases in section 1.5.3 can be allocated as shown in Table 7 below. If the incumbent is competing with the entrant in an innovative market, the risks of sunk costs and free riding will be high. The MIE's control is the motivation of innovation, which otherwise can be endangered by free riders. If the incumbent does not compete with the entrant, the free riding concern should be less. Similarly, the impact of free riding and sunk costs *on the incumbent's incentives to innovate* could be less if the market involved is non-innovative. One could therefore identify the incumbents who have a legitimate concern about the sunk costs and free riding risks from those who only make a 'me too' argument. To focus, we will only analyse the markets where the risks of sunk costs and free riding are high: the incumbent competes with the entrant in the innovative markets. If the risks of sunk costs and free riding can be minimised in these circumstances, they could be minimised in the easier circumstances. This taxonomy is subject to an exception. If the free riding directly affects the motivation upon which the incumbent innovates, then the risk of negative impact from free

riding is high regardless of whether the incumbent compete with the entrant or not. A good example of this situation is *British Horseracing v William Hill* [2001] ECLR 257.¹⁹⁷

Table 7: market structure and the dual risks

		<i>Risks of sunk costs</i>	
		Innovative markets	Non-innovative markets
<i>Risks of free riding</i>	Competing	<i>US v Microsoft</i> (re Web browser) <i>Sun v Microsoft</i> (re Java) <i>Microsoft Europe</i>	<i>IMS Health v Commission</i> <i>Kodak v Technical Image Services</i> <i>Commercial Solvents</i>
	Non-competing	<i>Intel v Intergraph</i>	<i>Magill</i>

After narrowing the scope of analysis to relevant situations, the next issue is to identify a measure that commensurate the risks. A refusal to license would be an extreme solution if the entrants are ready to pay the incumbent for the latter's R&D investment. Hence, the question of innovation is not only whether the incumbent should have had the right to refuse to license (a time incentive), but also at what price it should charge the entrant for the MIE license (monetary incentives). If the R&D costs can be compensated by money, arguing about the right to refuse licensing is an over-reaction.

5.1.3 THE MONETARY INCENTIVES

Regarding the monetary incentives, a reasonable access price could be set through negotiation. However, how can such a negotiation result in a fair price, if the incumbent is a monopolist? According to Coase (1960), there are two possible methods for tackling the monopoly problem: either to recognise this market failure as a fact and call on the government to set the price (top-down approach, so-called Pigouvian taxation), or to reduce the monopoly

¹⁹⁷ See Phillips and Firth (2001: 362). William Hill (WH) accessed a database developed by the British Horseracing Board (BHB) as part of its betting business, and was sued for infringement of database rights. WH alleged, among other things, that it had not 'free ridden' BHB's effort, as access to the database is freely available on the Internet. Judge Laddie rejected this argument, holding that the information extracted by WH is the most valuable part of BHB's database. The case refers to the ECJ for interpretation of the Database Directive 96/9/EC. Setting aside the technical parts, there is a policy behind the judgement, which is to provide an incentive to invest in the database; and the words 'incentives' bear a broader meaning than just profits, see also Lehman (1998) and Westkamp (2000). See section 5.4.3.a for further discussion.

power of the incumbent by negotiation (bottom-up approach). At this stage, the preliminary questions are: (1) which approach will take priority, top-down or bottom-up? (2) What are the players and the nature of the MIE pricing game?

Concerning the first question, a top-down decision, however 'fair' and 'exact,' would face a risk of arbitrariness. Consequently, either the incumbent or the entrant will be dissatisfied. Phillips and Firth (2001: 28) emphasize: "if [a fair royalty] cannot be easily found, then the expense of referral of the matter to an arbitral body, and the resulting uncertainty, may detract from the advantages of the compulsory license system." At the international level, it is also unclear who is competent to measure a 'fair remuneration'. Alternatively, a bottom-up approach is based on voluntaries, and therefore is more sustainable. Our proposal to the monetary incentive is therefore limited to the bottom-up approach only.¹⁹⁸

Concerning the second question, there are three players in the game of bargaining for a standard access price: the incumbent, the entrant and the consumer. As the incumbent wants the highest access price possible and the entrant wants the lowest access price possible, the latter may not want to reveal to the incumbent how much he values MIE access (see e.g., Baird *et al.*, 1994: 122). If the incumbent changes a high MIE license fees to the entrant, the latter will be likely to pass the burden on the consumers, and the latter will suffer detriment. Our objective is to protect the consumer turning a non-cooperative game to become a cooperative one, so that the parties will end up with a fair deal.

¹⁹⁸

To avoid repetition without contribution, top-down calculation of access fee will not be analysed in this thesis. Regarding the pricing methods in the field of communication technology, see the 15 pricing factors set forth in *Georgia Pacific Corp. v US Plywood Corp.* (1970) 318 F. Supp. 1116-20, including previous royalty rates by the rightholder, previous royalty rates by licensee/infringer, profitability of the product, availability of other, substitute technology, industry custom and average rates. See also Black (2001: 113) for the FCC's 1983 Access Charge Rules in US law, Anderman (1998: 219) for the *OFTEL Regulation of Conditional Access for Digital Television Services* in UK law, and Larouche (2000: 235-237) for EC law.

5.1.4 THE TIME INCENTIVE

Consideration of the time incentive would be appropriate when the monetary incentives cannot prevent the risks of sunk costs and free riding, to the extent that they may affect the incumbent's incentives to innovate. However, this time incentive should not be excessively long. They should end when the incumbent's sale revenue has offset the R&D costs.¹⁹⁹

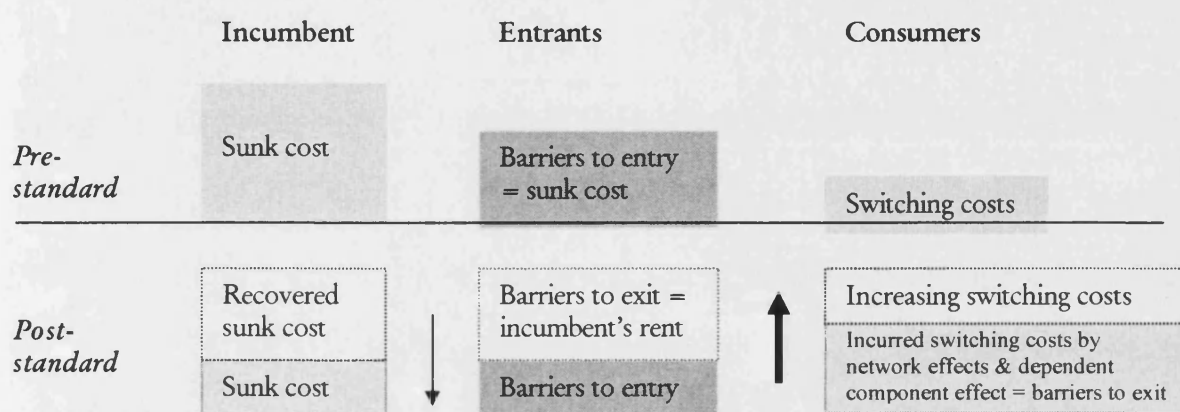


Figure 19: relationship between sunk costs and switching costs

Therefore, the issue is not whether the incumbent should have had the right to refuse to license because the sunk costs are too high, but *when* these costs have been recovered or will be recovered. Timing is important to protect the consumers from suffering high switching costs. On the one hand, if access to a standard were granted too early, sunk cost would not be recovered. On the other hand, consumer's switching costs can increase if MIE access is not granted. Figure 19 above shows the decrease and increase in costs, and the need to strike a balance between the two.

¹⁹⁹ In *Aer Lingus/British Midland Airways* OJ [1992] L96/34, the Commission only required Aer Lingus to interline with BMI for two years, which was sufficient to facilitate BMI to recover its initial investment, increase its quality to compete with Aer Lingus (increase ΔU), in a market where S is low (consumers do not incur much indirect costs while switching from one airline to another). However, the method to prove the two year period remains controversial. See also Anderman (1998: 201).

5.2. THE TIME INCENTIVE IMPLEMENTATION

5.2.1 RETHINKING THE COMMON ASSUMPTIONS OF SUNK COSTS

As noted, the question with the time incentive is how long can the incumbent refuse to license an MIE? The answer depends on the necessity of the incentive. Before discussing when the time incentive is necessary to recover the R&D sunk costs, three common assumptions about sunk costs that might exaggerate the risks should be highlighted. These assumptions are: (1) the exclusive right to refuse to license is the only method to recover sunk costs, (2) R&D costs are always sunk costs, and (3) it is impossible to calculate sunk costs.

a. Assumption 1: refusal to license as the only method to recover sunk costs

The first assumption is based on a postulation that if an R&D project fails, all R&D expenditure will be wasted, similar to an unsuccessful investment in tangible assets. This assessment is not correct. Cooter and Ulen (1997: 40) note that R&D expenditure on knowledge and experience is not completely wasted. At the very least, the innovators could recover the sunk costs in R&D failure indirectly through learning by doing, where the failure in the first project is the origin of the success in the next project.²⁰⁰ The second indirect method to recover sunk cost is knowledge reuse.²⁰¹ In addition, a specific form of joining R&D forces is through transferring the R&D results or being acquired by larger companies.²⁰² Learning by

²⁰⁰ See Ichbiah and Knepper (1991: 97-100) on the Microsoft's failure of the VisiCalc project.

²⁰¹ See *IP Guidelines*, sec. 3.2.2. Sutton (1991: 320) and Sutton (1998: 345 and 387), through the competition in the computer industry on the IBM 360 standard and its aftermath, observe that the best strategy to compete with a proprietary network is to join an open network. The purpose is to improve the network until the open network could outperform the proprietary network. OECD data (2002a) indicated that software is the sector that particularly attracts most strategic alliance to share or recover R&D expenditure.

²⁰² E.g., the acquisition by Microsoft of Connectix in 2002, whose main motivation is to acquire Connectix's technology in Virtual PC, a program that allowed Mac users to use Microsoft's software, <<http://www.connectix.com>>, accessed 28 Apr. 2003.

doing and knowledge reuse are the safety net for the incumbent to recover the sunk costs. They can partly remedy the risks that the time incentive might have been finished ‘too early’.

b. Assumption 2: R&D costs are always sunk costs

Many economists, such as Stiglitz (1997: 125), Sutton (1998), Pindyck and Rubinfeld (2001: 208) assume that all R&D costs are *prima facie* sunk costs. This assumption can be over-simplistic. If one knows a cost is ‘sunk’ in advance, why would he incur it? In subparagraph (a), we have listed two instances where R&D expenditure is recovered, and they are not the only ones. According to Pindyck and Rubinfeld (*id.*: 204), sunk costs are the costs that a firm cannot recover should it exit the market, not the R&D costs as such. Even saying that sunk costs are the costs of exit is not entirely correct. In general, all costs, sunk or otherwise, in the end should be met by quality improvement, costs reduction or an increase in sales revenue. The incumbent incurs a cost in the expectation that he could raise the sales revenue in the future. According to McFadden and Peltzman (1987: 940), R&D investments may become sunk, but they actually become sunk costs only if these investments do not improve the incumbent’s returns. Whether the costs are sunk will depend on the result of marketing, not the nature of the costs. Sunk costs are the *costs of failure upon exiting a market*.

One may ask: why should R&D failures be different from other failures such as mismanagement? The answer is in the policy to promote R&D. The law should tolerate R&D failure because of the value of R&D to society, not on its success, but on getting more knowledge (see e.g., Quah, 2002). One could learn from a failure as much as from a success. However, it is incorrect to say that all R&D costs are sunk costs, and that the risks of sunk costs in all R&D projects are high. One should be more specific about the risk of failure rather than easily accept that all R&D investments are sunk costs. A too lenient treatment of sunk costs could nurture a bad management attitude (moral hazard, see Stiglitz and Driffill, 2001: 109).

c. Assumption 3: it is impossible to calculate sunk costs

The assumption 3 is the most difficult to rebut, although it has not been extensively discussed. It is almost impossible to calculate the relevant sunk costs that have created an MIE, due to three reasons. Firstly, R&D costs are ongoing expenditure. Once a cost calculation is finished, it is already incorrect because new costs have been incurred. Secondly, R&D expenditure is used in many applications (see e.g., Granstrand, 1999: 145). Our rebuttal of assumption 1 shows that learning by doing, and knowledge reuse are two relevant factors in the recovery of sunk costs. For the same reason, an MIE can be a result of ‘knowledge reuse’, such as the scroll bar on the screen of Windows is a result of innovative effort of Microsoft Office (Gates, 2000). It is impossible to calculate how many ideas have been used in order to create a product, and how many products have been created from an innovative idea. Similarly, before coming to an inventive idea, the incumbent might have spent time and money for many experiments in vain. These costs of failure should be recovered (see assumption 2), but how could we be sure that these costs are devoted exclusively to the MIE innovation, and not other project? Thirdly, it is impossible to show how R&D expenditure has been spent. For example, we know that Microsoft’s annual budget for R&D in 2001 was \$5 billion. Although we do not know how this budget is allocated, these investments would have been possible if Microsoft have not had gained monopoly profits in Windows and their application programs. If the court narrows the scope of sunk costs recovery only to the extent necessary to create the MIE, then the incumbent would lack fund to pursue revolutionary inventions.

The first challenge (sunk costs are ongoing expenditure) can be answered by the taxonomy of sunk costs (Pindyck and Rubinfeld, 2001: 205). The first type of sunk costs is the *ex ante* sunk costs, expenditure that has been incurred in the past (until the date the dispute arises). The second type of sunk costs is the *ex post* (or prospective) sunk costs – future expenditure that would not be recoverable once incurred. At the time MIE access is pending, the incumbent has only spent *ex ante* R&D expenditure. *Ex post* R&D expenditure and its ‘sinking’ scenario are still speculative. *Ex ante* sunk costs are recoverable when the incumbent’s financial report shows that he makes profits, or when the entrants are ready to share these costs. With respect to *ex post* sunk costs, which can incur any time in the future, the incumbent can recover them by a

‘monetary incentives’ or through learning by doing and knowledge reuse. If the incumbent believes that a cost cannot be recovered, he should not incur it in the first place. As argued in section 5.1.4, exclusive rights to MIEs should be the last incentive. Moving from the above, only when the incumbent has not recovered its *ex ante* expenditure in developing the MIE, and no entrants can share these costs in a MIE-related market, should the court then consider the time incentive. Thus, the court can set a cut-off day, similarly to the cut-off day of a tax year, to separate between the *ex ante* sunk costs and the *ex post* sunk costs.

The second challenge (one R&D expenditure can be implied in many applications, and an invention is a result of many failures) is correct. However, it applies not only to the incumbent but also to the entrants (see Stigler, 1968: 67). As noted in subsection (b) above, the main idea of allowing the innovators to recover the sunk costs is to promote R&D by tolerating R&D failure.²⁰³ If the law supports undertakings taking risks in R&D by allowing them to recover the costs of failure, then not only should it support the successful undertakings but also should it give the failed undertakings a chance to compete in the next round. Otherwise, how could the failed undertakings innovate if by losing the innovation in the first round, they have lost the necessary consumer base for the second round’s competition? Many undertakings invest in R&D to develop standards, but R&D recovery is not always awarded to those who had invested the most.²⁰⁴ As Jorde and Teece argue (see section 5.1.1), when the market is contestable, the firm that loses in the first round of competition is in a serious disadvantage compared to the incumbent, because it has lost the necessary consumer base that could support it in the second round of competition.²⁰⁵ The policy that allows only successful R&D investment to be fully recovered might discourage rather than encourage innovation (Quah, 2002). In the same line, I

²⁰³ For similar discussion in the context of patent, see Phillips and Firth (2001: 28, sec. 3.9). In addition, Stiglitz and Driffill (2001: 25) also warn that if society provides greater incentives than necessary, total output is likely to be higher but there will also probably be greater inequality (incentive-equality trade-off).

²⁰⁴ OECD (2002b: 316) showed that in the software industry, IBM, Sun and HP could be more innovative than Microsoft (if we calculate the number of software patents granted). In the market however, Microsoft is clearly more profitable than the other three companies.

²⁰⁵ For similar discussion in the context of patent, see Phillips and Firth (2001: 28, sec. 3.9).

have raised the problem of the lack of support for failed undertakings. However, my argument is not that the state must subsidise the failed undertakings. My point is that an inexact but transparent method of calculating R&D expenditure should be acceptable, as long as it gives a sufficient incentive to innovate, not only for the incumbent, but also for his competitors.

The third challenge (monopoly profits are necessary to fund future R&D), assuming this is true, is also applicable to both the incumbent and the entrants. There is no guarantee that the incumbent will use the R&D expenditure in mega-projects more efficiently than the other undertakings.²⁰⁶ Antitrust law has been introduced for more than a hundred years, but we have not experienced that more competition will result in less innovation. If the incumbent needs R&D fund for mega-projects in the futures, they can join force with the entrants, or eventually request support from the state (Towse, 2001 and Quah, 2002). As noted in section 5.1.4, the time incentive entails both the costs and benefits to the consumers; its use should be proved by necessity rather than hypothetical allegation.

5.2.2 RATIONALISING THE TIME INCENTIVE

a. The time incentive applies only when ex ante sunk costs are not yet recovered

The above analysis shows that there are many possibilities to recover sunk cost without recourse to the time incentive. Our arguments are:

- 1) A time incentive could increase switching costs for the consumers and enable market inefficiency. Therefore, this incentive is appropriate when no other measures may remedy the risk of sunk costs and free riding better, in terms of social costs and benefits.

²⁰⁶ Following the theory of transaction costs and the nature of the firm of Coase (1937), when the size of a firm surpasses a certain level, new ideas and extraordinary inventions are less likely to be accepted in the large firm than they are in the small firm, due to bureaucracy and the switching costs inside the firm, between different divisions. For example, Robert Glaser, the chief-executive of RealNetworks used to be a chief software engineer of Microsoft (see Lohr, 2004). If he had enjoyed the multi-billion dollar R&D budget in Microsoft, he would have contributed his innovation to Microsoft rather than starting up a new firm.

- 2) Not all R&D investments are sunk costs, only the costs of R&D failure upon exiting a market are. Time incentive is only one among many means to recover the sunk costs, such as learning by doing and knowledge reuse.
- 3) The calculation of sunk cost needs not be exact, but it must provide the incumbent a chance to recover *ex ante* R&D expenditure, which is directly related to the MIE, to provide a sufficient incentive for innovation.

b. Calculation of ex ante sunk costs

Ex ante sunk costs can be difficult to calculate because an MIE, being an interface of a data format, is related to many product markets. The cost of making an interface can be low, whereas the costs of promotion for such an interface to become an MIE could be significantly higher. These costs should be included in the scope of the *ex ante* sunk costs. Calculating all relevant '*ex ante*' sunk costs in association with the development of a standard would be difficult if the range of the MIE-related products is continuously expanding. It is therefore necessary to reduce the scope of the *ex ante* sunk costs to the relevant market where the entrants seek to enter. Although this is an economic rather than a legal issue, I would like to put across some ideas and address two questions (1) how can we calculate the *ex ante* sunk costs? (2) which part of the *ex ante* sunk costs should be covered by the entrant before he can seek access?

The answer to the first question (*ex ante* sunk costs) can be found by analogy from the competition rules on predatory pricing. According to Areeda and Turner, the production costs, which include the *ex ante* sunk costs, should be either the short-run marginal cost (SRMC) or the average variable cost (AVC), and pricing below these levels are unlawful.²⁰⁷ If a competition authority knows how to apply the AVC method to determine whether the incumbent has imposed predatory prices, they can apply the same method to estimate the *ex*

²⁰⁷ AVC is calculated by dividing its variable costs by its actual output; see Areeda and Turner (1975). Whish (2001: 647) criticises Areeda and Turner's method for difficulty in assessing evidence in order to calculate the AVC. This method of calculation has been used in *AKZO v Commission* [1991] ECR I-3359

ante R&D costs invested to build the product. However, Whish (2001: 651) criticises the AVC and SRMC methods, as they do not take into account the economies of scale and of scope present in the software sector. This critic requires an alternative method to calculate the relevant costs involved in network development, entitled the long-run incremental cost (LRIC, see Whish, 2001: 652). This method has taken the total long-run capital and operating costs of supplying a specified additional unit of output (“the increment”) into account. It also requests a separate accounting for the product whose market the entrant seeks entry.²⁰⁸

In reality, the calculation of *ex ante* R&D costs can be complicated, but it is not as difficult as it appears to be in theory. Since the *ex ante* sunk costs are the costs that have been incurred, they are supposed to be recorded in the firm’s book of accounts. *Ex ante* network promotional costs should be demonstrated by the historic cost accounting method.²⁰⁹ The incumbent could take the profits in the second stage and deduct the costs in the first stage to see whether any costs, including R&D expenditure, have been recovered.²¹⁰ In addition, as tax law allows losses, including the loss from unfruitful R&D, to be deductible and carried forward, the fact that a firm is profitable in a financial year shows that its *ex ante* R&D costs, sunk or otherwise, have already been recovered.

²⁰⁸ The principle of separate accounting is emphasised in *Deutsche Post (id)* and the Interconnection Directive (Council Directive 97/33/EC, OJ [1997] L 199/32), Art. 9(2). In *Deutsche Post*, the dominant firm is required to set up a separate legal entity for the product in which the cost will be calculated. Each year, Deutsche Post must submit to the Commission a financial statement of this entity’s loss and profits and itemised statement of transfer prices of all goods and services procured by the entity. See also OFT (1998) *Guidelines to Competition Act 1998: the Application in the Telecom-munication Sector*.

²⁰⁹ This method records costs according to the ‘first-in, first-out’ principle, without taking into account the future value of an asset (‘mark-to-market’). Hence, if an expenditure was spent on R&D, it will be recorded as cost and deductible against revenues for tax purposes (Boos, 2003: 76). When the sales revenue is higher than the total relevant costs, the firm make profits, and the costs (including the R&D cost) have been recovered.

²¹⁰ Normally economic costs are different from accounting costs in that the former include opportunity costs and the latter do not. However, when a cost is sunk, its opportunity cost is zero (he will lose it anyway), therefore economic cost equal accounting cost in sunk cost calculation (Pindyck and Rubinfeld, 2001: 205).

Viscusi *et al.* (2001: 830) and Boos (2003: 198) even goes further by pointing to the fact that in reality, economic profit can be achievable at an earlier stage than accounting profit, making *ex ante* sunk cost recovery more feasible. This is because accountants expense R&D rather than capitalize and depreciate them as they do to other fixed capital investments. This does not reflect the reality. As argued in 5.2.1.a, knowledge from R&D is reusable and can last for many years. It is an investment rather than an expense. We can explain this observation as follows:

$$\text{Accounting profit } \Pi_A = R - VC - r\&d - d_k K$$

$$\text{Economic profit } \Pi_E = R - VC - d_{rd} r\&d - d_k K$$

where R is revenue, VC is variable costs, $r\&d$ is current expenditures on R&D, d_k and d_{rd} are the depreciation rates of K and R&D capital ($d_{rd} < 1$). K is the fixed cost (plant and equipment) of investment. Because $d_{rd} < 1$, we have $\Pi_A < \Pi_E$. Therefore, if the accounting profit of the incumbent can cover his *ex ante* R&D expenditure, then clearly the economic profits can cover this expenditure as well.

To facilitate the calculation, separate accounting should be maintained for activities related to interconnection through the MIE and for other activities (see the preceding paragraph). In the near future, thanks to the development of identification technologies, such as IPv6 (Internet Protocol version 6), the MIE owner can have an identification number ('internet protocol', or 'IP') attached to any product that has been embedded with the MIE. He will have more information on how large his MIE network currently is, and what have cost him to expand the MIE network from the beginning to this stage.²¹¹

²¹¹

For more information on IPv6, see www.ipv6forum.com. IPv6 is the next generation of IPv4, the system of Internet Protocol that currently in place. IP is an identification protocol that helps devices or digital media communicate with each other on the Internet. The problem of IPv4 is that their number is limited, so that it is impossible to mark IP on each device. This problem can be solved with IPv6, which theoretically can manage 10^{38} hosts, sufficient to provide IP to each piece of software or media content. As long as IP is attached to a product, such a product is traceable anytime it is active and the PC is linked with the Internet.

The answer of the second question (which part of the *ex ante* sunk costs should be recovered) aims at two objectives. Firstly, it determines the amount of the *ex ante* sunk costs, which must be recovered by the sale revenue from a product market. Secondly, if the entrant wishes to enter a product market without waiting for the full recovery of the *ex ante* sunk costs, then the answer to the second question will determine the access price that he has to pay the incumbent. My argument is that such a price (Π) will be equal to:

$$\Pi = abC \quad (4)$$

- a is the participation of the relevant product market, out of the total turnover of the incumbent's network;
- b is the expected market share of revenues that the incumbent would lose after the entry;
- C is the total *ex ante* sunk costs for promoting the whole network, as estimated in the preceding paragraphs.

The rationality of Formula (4) is that if the entrant enters a market, in which the incumbent is operating, he should bear the costs proportionally to the *ex ante* sunk costs of promoting the MIE network, to which his product will be attached.

We can also explain the rationality of Formula (4) based on the probability of *ex ante* sunk costs' recovery, according to the Pascalian equation $p(A \text{ and } B) = p(A)p(B)$ in section 4.1.1. The probability to recover *ex ante* sunk costs in a network ($p(A \text{ and } B)$) shall depend on two probabilities: the probability of cost recovery in each market of the network, provided that the incumbent holds monopoly power ($p(A)$), and the probability that such a monopoly power might be lost due to competition from the entrant ($p(B)$).

Suppose that:

- $a = 10\%$, i.e., the niche market that the entrant seeks to enter has brought 10 percent of the total revenue of the incumbent in the whole network;
- $b = 20\%$, i.e., the expected market share that the incumbent may lose to the entrant is 20 percent.

By Formula (4), the access price that the entrant should pay is $0.1 \times 0.2 = 0.02$ or 2 percent of the *ex ante* network promotional costs. If the entrant joins a market in which the incumbent is not active, or the incumbent withdraws from the market after the MIE license, then the market share he will lose to the entrant would be 100 percent ($b = 100\%$), and the entrant must pay 10 percent of the *ex ante* switching costs of promoting the network.

If the MIE-related product is freely downloaded (such as the media players in section 4.3 above), then $a = 0$, and the entrant does not have to pay the incumbent for the access.

If the entrant seeks to enter many markets at the same time, the costs he shares will be proportional to the *ex ante* sunk costs of promoting all of these relevant markets by the incumbent. If the market the entrant seeks to enter constitutes the whole network of the incumbent (see *IMS*, in section 1.5.3 above), then $a = 1$ (i.e., 100 percent), and Formula (4) becomes $\Pi = bC$ (4a).

The calculation of entrant's share in the *ex ante* sunk costs in Formula (4) is influenced by the efficient component pricing method (ECP) of Baumol and Sidak (1994).²¹² This method requires that the access fee paid by the entrant to the incumbent (Π_2) should be equal to the

²¹² The ECP is subject to many assumptions: the monopoly's price for the complementary service has been based on a marginal-cost pricing rule; the monopolist's and rival producer's components are perfect substitutes; the production technology of the component experiences constant returns to scale; the rival producer has no market power; and the monopolist's marginal cost of production of the component can be accurately observed. For the critique of ECP, see Economides and White (1995); Anderman (1998: 216); and Ridyard (1996: 450-51)

incumbent's opportunity costs of providing access, including any forgone monopoly profits. Assume that there is only one market ($a = 1$), we have:

$$\Pi_2 = bP_m Q.^{213}$$

- $P_m(Q)$ is the total monopoly profit, as explained in Figure 6 (section 1.2.1.b), which is the monopoly price (P_m), multiplied by the total quantity of the products sold in a homogeneous market (Q);
- b is the loss of monopoly profits, in terms of market share loss.

The ECP method has been applied in *Clear Communications v Telecom Corporation of New Zealand* [1995] 1 NZLR 385 (see e.g., Anderman, 1998: 217). Anderman (*id*: 216, 226), Kahn and Taylor (1994), Economides and White (1995), Noam (2001: 86) criticise this method as unrealistic. Since the entrant must compete with the incumbent, he cannot gain as much as the incumbent when the latter was a monopolist, and cannot pay the incumbent an access fee equal to the latter's opportunity costs. In addition, as the incumbent needs not pay the MIE access fee, he is able to price his final product lower than the entrant does. The entrant cannot compensate the incumbent for monopoly profits except by overcharging consumers. If that were the case, the anti-abuse measure would lose any significance.²¹⁴

²¹³ This equation is formulated from the definition of ECP. The ECP formula can be explained by a different method than market share loss, in a Cournot duopoly market, see Economides and White (1995).

²¹⁴ Justice Gault in *Clear Communications* has raised this concern; see Anderman (1998: 218). Although the Privy Council has later rejected this concern, it had done so because of a statutory right for a telecommunication company to obtain monopoly profits. The Court did not consider whether telephone tariffs have been reduced because of the ruling, and whether consumers have benefited from the ruling. Please note that in *Brooke Group Ltd. v Brown & Williamson Tobacco* (1993) 509 US 209, the US Supreme Court also held that the test used in pricing should be the 'equally efficient competitor' test, not the 'equally monopolist' (or ECP) test, see Werden (2004: 2-6).

In our proposal, P_mQ in the ECP formula has been replaced by C in Formula (4a). The latter (*ex ante* sunk costs) is the real loss, which must be compensated, as opposed to the hypothetical loss in the ECP formula. By doing so, the outcome will be both plausible and equitable. This method is plausible because competition authorities would have more experience in calculating market share than the loss of monopoly revenue. This method is equitable because the compensation will be the market share multiplied by the *ex ante* sunk costs (unchanged even *after* the license), not by the monopoly revenue *before* the license.

With respect to Formula (4), the burden of proving the market share that the entrant intends to capture (b) is on the entrant. The burden of proving the percentage of revenues from the relevant product market out of the total turnover of the incumbent's MIE-related network (a) and the *ex ante* sunk costs (C) is on the incumbent, as he is the only one who possesses information on these matters. If C is too difficult to estimate, the court can provide a grace period in which the incumbent does not have to prove the recovery of *ex ante* sunk costs, as a hard and fast rule.²¹⁵ If, after the grace period, the incumbent fails to show convincing evidence within a reasonable deadline fixed by the court, the latter will assume that the incumbent has recovered his *ex ante* sunk costs. The time incentive will lapse and the only available option for him to recover sunk costs is through the monetary incentives.

5.3 A MONETARY INCENTIVE BY THE RUBINSTEIN BARGAINING MODEL

As concluded in section 1.5.3, we have narrowed the scope of analysis of monetary incentives to the bottom-up method – to define a fair access fee through a negotiation between the incumbent and the entrant. The key question now is how to persuade the parties to agree upon a fair access price when they have private information, have conflicting interests and unequal bargaining powers. As Viscusi *et al.* (2001: 181) remark, access fee should not be too

²¹⁵ As an example, *IP Guidelines*: 3.2.2 noted that a normal time to recover *ex ante* sunk costs and win consumer acceptance is two years from commercial introduction. For similar position, see the opinion of Mischo AG in *Renault* [1988] ECR 6039, para. 17 and 63, quoted by Anderman (1998: 216).

high to deter entry. Here game theory can offer assistance, through the Rubinstein Bargaining model (Rubinstein, 1982).

To be sure, a game itself cannot estimate a ‘fair’ price. What is ‘fair’ is an outcome of either costs calculation or subjective assumption. A game is a set of formal tools to study the strategies of the players, who have beliefs on their own initial payoffs (see Glossary; and Baird *et al.*, 1994: 308). We have to assume that each party has its own ‘subjective fair value’ of the MIE access, but do not want to reveal his information.²¹⁶ Our purpose is a fair bargain, in which the incumbent will not overprice its MIE access or the entrant will not under-price the MIE license. To this game, we will also assume that the incumbent has recovered its *ex ante* sunk costs in relation to the MIE. Otherwise, please refer to 5.2.2.b for the method of calculating these costs. The payment made by the entrant to the incumbent will be reserved to cover the *ex post* sunk costs, so that the incumbent will have a sufficient incentive to innovate.

5.3.1 BALANCE OF RISKS – THE CORE OF THE RUBINSTEIN BARGAINING MODEL

The starting point of Rubinstein bargaining is the Ultimatum Game. The latter is a one-off game, in which two players decides to split N dollars. The first player has the right to offer the second player x dollars, and the second player might refuse or accept. Unless the second player accepts $(x, N-x)$, both parties will obtain nothing $(0, 0)$ and the game ends. Rubinstein (1982) has modified the game. He allows the players to renegotiate in an indefinite number of negotiation rounds until the deal is struck. However, there is an important condition: delay matters. That is, the value of N is reduced at a discount rate of δ after each round of negotiation (e.g., because of inflation). According to game theory analysis, a strictly rational second player would accept whatever the split that the first player offers under the Ultimatum Game, because it is better than receiving nothing when negotiation fails (see e.g., Kreps, 1990: 119). Under Rubinstein bargaining (1982: 97-110) however, the parties are likely to split the stake equally.

²¹⁶ I am indebted to Professor Michele Piccione from the Economic Department, LSE for this suggestion.

In September and October 2003, I conducted two experimental studies of Rubinstein Bargaining in Vietnam and United Kingdom.²¹⁷ The questions posed were: (1) if you are the offeror in any round of negotiation, how much will you offer in the split (S)? and (2) if you are the offeree in any round of negotiation, how much will you accept in the split? The results from the experiments show that the majority of respondents have quickly decided to split the stake in half, no matter whether the negotiation is one-off or it will last indefinitely.²¹⁸

The experiments show the importance of the *balance of risks* in negotiation. Both players want to make a deal rather than break it. If the players do not intend to conclude a transaction, they may not even enter into negotiation in the first place.²¹⁹ An unreasonable offer may solicit anger from the counter-party to no avail. Such a hostile move is not worth the transaction costs involved. If an offer were unreasonable and rejected, the offeror would risk receiving an equally bad or worse counter-offer, which he must reject. Time is wasted and the stake gets smaller. Using backward induction, we can see that a rational player should place a fair price from the beginning to save time and costs. That is, he must place an attractive offer, so that the probability for it to be accepted is larger than the probability of rejection.

²¹⁷ The experimental study in Ho Chi Minh City has been set among 205 law and economic students (86 males and 119 females). The amount at stake has ranged from a real VND10,000 (equivalent to US\$1) to a fictitious VND10 million (equivalent to US\$1000). The experimental study at the London School of Economics (LSE) was with 57 law students (22 males and 35 females). The amount at stake was £100.

²¹⁸ In reference to the first question, the result shows that the first players usually show generosity to a low stake but rationality to a higher stake, where the offered amount ranges from 40 percent of the stake (18 percent of the Vietnamese students) to 50 percent (44 percent of the Vietnamese students and 82 percent of the LSE students). The first players very rarely offer a low stake such as 10 percent to the second players. In respect of the second question, 29 percent of the Vietnamese students have replied that they would be happy being offered 30-40 percent of the stake; 39 percent of them replied that they must receive between 41-50 percent of the stake. Nearly 62 percent of the LSE students replied that they must receive at least 50 percent of the stake, and 15 percent said they must receive at least 60 percent.

²¹⁹ The experiments of Rubinstein (2003) conclude that both players want to reach an agreement rather than have no agreement at all. He conducted several surveys through the Internet with the students in Tel Aviv University, Tilburg University and LSE. From 40 to 45 percent of the respondents said that they would split the stake (the \$10 bill) equally as the offeror. On the other hand, from 60 to 70 percent of the students replied that they would accept 10 percent of the stake as the offeree. In Le (2003), the approval rate for a 1/9 split is only about 22 percent (in the experiment with Vietnamese students).

In particular, when the first player offers the second player 10 percent and retains 90 percent of the stake, the chance that the second player does not want to play a dominated strategy will be larger than in case both parties receive 50 percent of the stake. If the first player thinks of risk balancing, he does not want to be in a passive position by offering an amount that would likely to be rejected. As this argument goes, the first player should split the stake equally, especially when it is unclear whether the offeree is risk-favoured or risk-averse (see the Cake-Cutting Game in section 1.2.1). One may argue that the entrant can also play a grim strategy, i.e., he will reject any offer until he receives 99 percent of the stake. This scenario is not realistic. If the entrant delays, other entrants will move up and accept a reasonable offer. In short, not only the first player but also the second player should analyse the risk of failure.

To set a formula for the Rubinstein bargaining, let suppose that the value of the stake is N , and a discount factor (from delay) is δ . The first player offers S , leaving him $(N - S)$. As he must wait an additional period by repeating the offer, a counter-offer from the second player is more attractive if it gives the first player more than $(N - S)\delta$. In order to do so, the first player must at least offer S/δ initially to the second player, in which case he receives $(N - S/\delta)$, see Baird *et al.*, 1994: 222). When the first and the second offers of the first player are equivalent,

we set:
$$N - \frac{S}{\delta} = (N - S)\delta, \text{ or } \frac{S}{N} = \frac{\delta}{1 + \delta}.$$

A more complicated version of the Rubinstein bargaining model posits different account rates for the parties (δ_1 and δ_2 , respectively). Baird *et al.* (1994: 224) postulate that when the period between offers becomes arbitrarily short, the share that the second player enjoys is:

$$\frac{S}{N} = \frac{\ln \delta_1}{\ln \delta_1 + \ln \delta_2} \quad (5)$$

The key point in the Rubinstein bargaining model is that although the offeror enjoys the initial advantage, from the time the offer is put on the table, the advantage goes to the offeree. The latter can use delays as an advantage (so-called “exit option”, see Baird *et al.*, 1994: 221). In addition, the rule of the game grants the second player the right to preclude the first player’s

benefit through rejecting the offer. Hence, the risks facing both parties are equal. A fair deal can be struck not only by minimising the risk of failure in negotiation, but also by creating risks, so that the bargaining powers of both players are balanced (see also Le, 2004a).

5.3.2 MODIFIED RUBINSTEIN MODEL AND THE INCUMBENT-ENTRANT PRICE NEGOTIATION

The Rubinstein model is now applicable to two players: an incumbent and an entrant, on the MIE access price. To mimic the rule “delay matters”, the court can order that for each period of delay in reaching an agreement on a fair price, the incumbent will have to pay the court a fine, so that he has an incentive to accept a fair offer. A good example of the Rubinstein’s strategy was in *US v Microsoft* [1998] 165 F.3d 952, where the Columbia District Court has imposed a fine of one million dollars per day on Microsoft until it complies with the court order. Similarly, under Article 15 and 16 Regulation 17/62, OJ [1962] L 204/62 (as updated), the European Commission can fine an abusive dominant firm up to EUR 1 million or 10 percent of its turnover in all products, worldwide, in the preceding year. These sanctions are sufficiently severe to create an effect equivalent to the Rubinstein’s “delay matters” rule. Although the penalty is imposed on the incumbent only, for an entrant delay also matters (at the discount rate of δ_2) because he may lose business opportunity. If he hesitates, other entrants can approach the incumbent earlier with a better offer.

Suppose that the incumbent makes an initial offer of £1 million for the MIE access fee, and the entrant makes an initial counter-offer of £0.1 million. They will now negotiate how to split the surplus of £0.9 million (N). The split (S/N) will follow the Formula (5) in section 5.3.1 above. Below we will show that as long as the negotiation structure mimics the Rubinstein bargaining model, the parties will make reasonable offers voluntarily.

- If the entrant were keen to receive the MIE license quickly (δ_2 goes further from 1), he would have to make a better counter-offer in the next round.

- From the incumbent's side, we assume that $\delta_1 = 90\%$, being the discount rate of the stake. That is, if the first round of negotiation fails, the surplus at stake will be reduced to $N\delta_1 = \text{£}810,000$.
- This loss will urge the incumbent to make an offer, so that the entrant that has the lowest δ_2 will accept it.
- To speed up the negotiation, the court may rule that the incumbent will have to pay a penalty equally to $(\text{£}900,000 - \text{£}810,000 = \text{£}90,000)$, equivalent to $(1 - \delta_1)N$, so that after nine rounds, he would have lost any surplus he could possible obtain from negotiation.

The higher the penalty, the quicker the parties will arrive at an access price that benefits both parties. Our goal is not to find an 'optimal' penalty to impose on the incumbent, but to show a mechanism that can encourage the parties to end up with a fair access price, according to the information they have. If the incumbent would like to avoid the penalty, he may grant MIE access without charge, after recovering the *ex ante* sunk costs (this is an assumption in section 5.3.1 above). This would not put the incumbent in a disadvantaged position compared with the entrant, because he can compete with the entrant on a level playing field. In reality, a free MIE license is not rare. Upon request by the Federal Circuit, Microsoft has licensed rivals some of its Windows interfaces free of charge.²²⁰

As noted, in order to balance the risk of the incumbent (of being imposed penalty) with the risk that face the entrant, we have attached to it a discount rate δ_2 . To accelerate the negotiation process, we can make delay matters more, by exposing the potential entrants to an extra risk. Organising a bidding among them, as analysed below, can create such a risk (see Viscusi *et al.*, 2001: 451). However, the bidders may be biased, or they may disregard the risk if they deduce from the past actions a different result. To de-bias the bidders, it is necessary to either limit the

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Lohr, S. "Microsoft eases licensing on its technology " *NY Times* 4 Dec. 2003. As Microsoft has been steadily profitable since the mid 1980s (Ichbiah and Knepper, 1991, Appendix 1), we can assume that it has recovered all *ex ante* sunk costs necessary in promoting Windows and related products.

chance for deduction, or minimise the role of deduction from the past actions through transparency enhancement.²²¹ Baird *et al.* (1994: 213-216) has proposed either a closed and one-off Dutch auction or an open bid, so that one could make a decision after knowing what other bidders have decided. If one of the bidders stops bidding, other bidders could infer this as a negative sign. Based on both positive and negative information, the bidders could make a rational offer.

5.4 THE AFTERMATH OF AN MIE COMPULSORY LICENSE

5.4.1 COLLECTIVE ACTION AS THE KEY ISSUE

I have argued so far that as long as the incumbent can recover his *ex ante* R&D sunk costs, he would have an incentive to innovate. The entrant should pay the incumbent a fair price for MIE access, to be reached by negotiation, following the Rubinstein model. The next question is: what will happen to the incumbent after recovering his *ex ante* sunk costs and receiving a 'fair' royalty? If the incumbent or the entrant had known *before* that their MIE would be subject to compulsory license, when they have successfully recovered sunk costs, would they be willing to incur the *ex post* sunk costs to improve the MIE? To the above question there are two possible answers: (1) the incumbent and the entrant will invest, because in networked economies, the first mover will be likely to gain the largest market share (optimistic beliefs), or (2) they will not invest, hoping that another firm will invest first and then they will bring a lawsuit to demand compulsory access (pessimistic beliefs).

²²¹ See Le (2003). A game was set for 203 students, divided in three groups, as follows: you are hurry to go to school. There is a short cut road, but one part is a wrong way, and the probability of being caught by the police is 40 percent. The question for the first group was: 'will you go to the wrong road?' The question for the second group was: 'if you see many people successfully go without being caught (positive deduction), will you go to the wrong road?' The question for the third group was: 'if you see some people were caught by the police (negative deduction), will you go to the wrong road?' The result was that with negative induction, the percentage of people that would break the law was 20 percent. In the neutral group, such a percentage was 32 percent, and in the group inferred by positive induction, it was 44 percent.

For both viewpoints, collective action is the major risk in the aftermath of MIE license. From a pessimistic viewpoint, Korah (1994: 189 – 190), Alborn *et al.* (2000), Evans, Nichols and Schmalensee (2001) are concerned that free riding could give rise to a spillover effect or collective action, if people do not trust in the good faith of each other. From the ‘optimistic’ camp, Takeyama (2002), Scorba (2002), Bakos *et al.* (1999: 117) argue that limited free riding might actually benefit the incumbent, as it extends the customer base. However, these arguments do not address the concern as to how the competition authority can keep free riding to a ‘limited extent’, before it could become a collective action?

5.4.2 PREVENTION OF COLLECTIVE ACTION THROUGH THE STICK AND THE CARROT

According to Baird *et al.* (1994: 189-191), in order to prevent a collective action one needs to turn a non-cooperative game into a cooperative game. The end of a cooperative game is that each player pursues his best strategy by contributing to a common good, either paying for MIE access or sharing knowledge with the incumbent. Ellickson (1991: 124) proposes two methods that may ensure cooperation amongst self-interested players: the ‘stick’ (punishment for non-cooperative behaviour) and the ‘carrot’ (reward for cooperative behaviour). The first approach is taken after the free riding act has actually occurred. The second approach is a pre-emptive action to prevent the potential free riders.

The core of the stick approach is to identify a leader, who has an incentive to punish free riders. The leader could be the one who has the largest stake when collective action occurs. Suppose that the leader is the incumbent. When the entrant free rides, the incumbent must take action. He may withdraw the license to the MIE or impose damages to the entrant (tit for tat). Baird *et al.* (1994: 192-93) noted that tit for tat strategy could generate a credible threat to the potential free riders and prevent collective actions. Through several experimental studies, Axelrod (1990) also argues that tit for tat is the most effective method to urge parties with conflicting interests to co-operate with each other.

The above conclusions are more hypothetical than real, because the temporal effect of free riding can be severe. The free riders can price their products lower than the incumbent does.

The consumers are indifferent whether they buy a product from a free rider or a contributor, as long as the price is low. They may reward the wrong side of the game. In addition, if the incumbent ‘punishes’ the free riders by price competition to drive them out, he will face difficulty in increasing the price afterwards.

With the ‘carrot’ approach, the incumbent will only grant access to suitable entrants, who put the highest value on the MIE. High-valuers entrants understand that if they do not contribute, the incumbent will lack funds to maintain or develop the MIE-related network and the MIE-related products may risk becoming obsolete. Therefore, the high valuers will be ready to pay more than the low valuers will for MIE access. The problem with this approach is that the entrant’s valuation of the MIE is private and non-verifiable. Therefore, they should inform the incumbent a low value of the MIE, so that they have to contribute less than they should. If under-valuation goes unpunished, free riding may become a collective action.

To address this issue, Clarke, Grove and Vickrey propose a game, under which all players must decide how much they will contribute in order to produce a public good, provided that the low-valuers will have to pay a penalty when they indicate their valuation of the public goods (in this case the MIE) to be below a certain threshold. Under this structure, the players reach a Bayes-Nash equilibrium (the best payoffs) when they declare their true value. The success of the model is that each player’s valuation of the public goods is independent. However, only the players that have valued the public goods more than their contribution would have access.²²² When we apply this model to the MIE license, it would imply that the incumbent should be allowed to charge the entrants for the *ex ante* promotional cost (*IT*), following the calculation in section 5.2.2, as a method to screen free riders (see also Baird *et al.*, 1994: 85-87, 112-17).

A drawback of both the stick and the carrot approaches is that they do not facilitate joint innovative effort of the incumbent and the entrants. These approaches could work when one firm is the leader, which also undertakes all innovative effort. Other undertakings will ‘pay as

²²² The Clarke, Grove and Vickrey’s mechanism is summarised in Baird *et al.* (*id.*: 206-07).

you go'. When the MIE or the MIE-related products require constant innovation, regulators should focus on the long-term objective of free riding prevention. That is, how to maintain a favourable environment for innovation incentives. Below we will analyse the favourable and unfavourable conditions after the MIE license that may support or against innovation.

5.4.3 THE INCENTIVES FOR MIE INNOVATION

a. The favourable conditions of innovation after the MIE license

After the MIE compulsory licensing, consumer demand for the incumbent's product may decrease, as the network supports both the entrant and the incumbent. At the same time, the entrant's threats will increase. Since the incumbent can no longer exploit switching costs and leverage power, he must gain the customers' positive feedback on merits, i.e., by innovation, not by rent seeking. This task seems to be difficult, but the development of the Linux platform and the General Public License (GPL) shows that it is possible.²²³ The key for competition feasibility is in the heterogeneity of consumer demand – in other words, market opportunities. Oliver and Marwell (1988), Scherer (1986: 198), O'Hare (1988: 75) and Hirshleifer (1990) argue that undertakings will be motivated to innovate as long as there are sufficient profit opportunities resulting from innovation. As long as the incumbent and the entrant can compete in a level playing field, who gains monopoly power by superior products or business acumen is no longer a competition law concern (*US v Grinnell* [1966] 384 US 563: 570).

In addition, the 'durable good' threat is another driving force to innovate, which applies to both systems - Windows and Linux (see section 1.2.2). Consumers will not replace the old software product unless a new one is much improved. Foster (1986) and O'Hare (1988: 111)

²²³ See Stephens (2000) and Lambert (2001). A good example is MySQL database toolkit. The source code of MySQL (protected under GPL) is accessible to the public. Software developers collect fees through services in integrated packages. Those who acquire its product free must agree to document and share any improvement they made. Otherwise, MySQL will sell them the same program for US\$395. Bulkeley (2003) noted that about 4,000 companies have paid MySQL a fee, compared with four million users of the free version, which in turn enhance MySQL network externalities.

argue that at a certain point, when incremental innovation in the old system has reached its maximum capacity, the underlying platform (i.e., the MIE) should also be improved. Statistics from OECD (2002a: 106-108, 119-111) shows that visionary companies have always seen the limit of the old system and prepared for the next wave of innovation. Noam (2001: 17-23) notes that network markets are likely to be dominated by either monopolistic or oligopolistic companies, hence price competition would be above equilibrium. Sunk cost recovery will be possible. In addition, network market is not a place for free riders. Entry requires large start-up costs; hence, undertakings must compete on merits. As the risks of sunk costs and free riding can be less, the policy that support compatibility among products can feasibly be implemented.

The above assessments presume that the incumbent has sufficient R&D capacity to carry out innovation, and the R&D capacity of the entrants does not threaten the existence of the incumbent's business. What would happen if these assumptions no longer hold true?

b. The first unfavourable condition: insufficient R&D capacity

When the incumbent has an insufficient R&D capacity to carry out continuous innovation in the market, Ulen (1999: 801-02) suggests that the entrant and the incumbent should cooperate. As noted in section 1.2.2, public goods, including MIEs, are non-rivalrous and non-excludable. Therefore, cooperation is the optimal approach because all the users of such a good share the costs of making it.

However, in order for cooperation to be feasible, transaction costs (i.e., search costs, negotiation costs and enforcement costs) must be low.²²⁴ Albanese and Van Fleet (1985: 245) describe the relationship between transaction costs and cooperation as follows. A group member will contribute innovative effort to improve the MIE and will generate two outcomes:

²²⁴ Ulen (1999): 803-06, Baird *et al.* (1994): 42. OECD (2001): 246 note that with low transaction costs and a policy toward interoperability will encourage collaboration in R&D.

common interests and private benefits.²²⁵ By observing the outcomes, the incumbent can find who are the free riders and who are the contributors.²²⁶ Those who contribute more to the MIE will receive more benefit. Finding contributors is not difficult, as they will show their signal by their performance results. Finding free riders is more problematic, as they are likely to hide their intention. If the entrants want to free ride, they may wait for the incumbent to contribute first.²²⁷ When free riding becomes collective action, i.e., when the number and the sale volume of free riders exceed those of the co-operators, it will destroy cooperation.²²⁸ To remedy this problem, many authors suggest that the number of the licensees should be reduced in order to identify and punish the free riders.²²⁹ As the number of licensees is small, an act of free riding will harm the interests of each licensee in a small group more than if it were a member of a large group. Therefore, each licensee would have an incentive to identify the free riders.²³⁰

²²⁵ Hardin (1968: 1244) demonstrates that private payoffs could play a more important role than common interests. He noted that the key question is not whether my effort is good for the common, but “what is the utility *to me* of adding more *my* (effort)?” See also McCarty (2001: 23-27).

²²⁶ Habermas (1996: 166) also demonstrates that the conditions for successful co-operation are to exclude free riders from the co-operative benefits and reward outstanding contributors. For that purpose, the incumbent must be able to identify the contributors and the free riders.

²²⁷ Stigler (1974) called it “cheap riders”, i.e., those who pretended to contribute, but they only contributed low quality results, keeping high quality results for themselves.

²²⁸ See the studies of Guth, Schmittberger and Schwartz (1982), Ulen (1994), Andreoni (1988); quoted by Ulen (1999: 804-06).

²²⁹ See Farrell (1987: 34), Shah and Stiglitz (1987:98), Axelrod (1997: 111), Adar and Huberman (2001: 9), Cornes and Sandler (1996), Albanese and van Fleet (1985: 246). McFadden (2002: 7-8) argues that MIE access should be granted only to a small group of entrants that are capable of innovation. In practice, IBM and Dow Chemical are also selective when licensing their technology to other firms, to avoid free riders and guarantee stable stream of license fees. See Davis and Harrison (2001).

²³⁰ Albanese and Van Fleet (1985: 246). Axelrod (1997: 116) also notes that if firms having close interests can group together so that their size is equivalent to the incumbent, the latter will more likely to ally with them to develop a common standard.

Cooperation between the incumbent and the entrant to develop the MIE after compulsory license is possible not only in theory but also in practice. The empirical study of Axelrod *et al.* (see Axelrod, 1997: 96) shows that rivals, such as AT&T and Sun Microsystems, have joined forces in supporting UNIX and now Linux as standards for operating systems. They stipulate that the firm's incentive to cooperate will outweigh the disincentive when there are either common interests or common threads (*id.*: 105). Regarding the common interests, the incumbent would be keen to collaborate with the entrant in order to reduce R&D costs.²³¹ Regarding the common threats, a good example can be seen in the innovation effort supporting Linux platform of IBM and Sun. As Microsoft's market power is overwhelming, they understand that unless they co-operate to support Linux, they are not able to compete on the merits.

c. Second unfavourable condition: threats from a strong entrant

If the incumbent's R&D capacity is weaker than the entrant's capacity, it may lose in the innovation race in the future. The entrants may be keen to research and develop the MIEs, but equally they may take the largest shares in the R&D success, and eventually drive out the incumbent from the market, as it was in the case of *Sun v Microsoft* [1998] 21 F. Supp.2d 1109. Sun is the copyright owner of Java virtual modules (JVMs), the applets that allows different software programs to interact with each other. It has licensed JVMs to Microsoft. Unknown to Sun, Microsoft has modified 40 Java interfaces and deleted two important standards in a JVM, making Sun Java's products less compatible with Microsoft Java's programs. Consequently, the users who bought Microsoft's products could interact better with Windows than those who bought Sun's products.²³² This perspective can make the incumbent hesitant to cooperate.

²³¹ See OECD (2001a: 176-179) on the case of MPEG2, when nine firms had formed a joint entity to convey a package license to their patents in digital moving picture technologies. Other examples of innovation cooperation between rivals nowadays are between Microsoft and RealNetwork to develop some aspects of media player standards, see *WSJ Europe* December 7, 2003.

²³² *Finding of Facts:74.* The Court noted that Microsoft took steps "to maximise the difficulty with which applications written in Java could be ported from Windows to other platforms, and vice versa."

OECD (1999: 158) concludes that a legitimate business reason to refuse to license would include, apart from sunk costs and free riding, protection of the incumbent's reputation and existence. Viscusi *et al.* (2001: 711) also notes that the best strategy to take when the future outcome entails too much uncertainty is the 'no regrets' option. On this ground, the incumbent should have the right to refuse to license, but he should bear the burden of proof.

5.5 THE ESSENTIALITY-JUSTIFICATION MECHANISM

5.5.1 THE NOTIONS OF 'ESSENTIALITY' AND 'JUSTIFICATION'

The arguments in Chapters 3, 4 and 5 aim to strike a balance between the interests of the incumbent and the interests of consumers. They set the standards upon which each interests can be estimated and compared, by a procedural rule rather than the substantive rules such as the essential facilities doctrine (see Figure 18 above). To crystallize these arguments, I would propose that the burden of proof in a process of Article 82 EC infringement should be allocated so that both the entrant and the incumbent have an equal chance to present their arguments. The entrant should prove the demand for his product and the necessity for MIE access to reduce switching costs of the consumer, while the incumbent should prove that his conduct is justifiable. This process is entitled the essentiality-justification mechanism. As seen in section 4.4, the first part (essentiality) is to show that access to the MIE is essential to reduce switching costs and minimize consumer detriment. The standard of proof for the entrant will be the balance of probabilities (see section 4.1.2).²³³ In the second part (justification), the incumbent should have an opportunity to question any challenges from the entrant and to explain why his conduct is justifiable, on the grounds of sunk costs and free riding. By submitting a balance of burden of proof, I do not request a 'shift' in the burden of proof. As Keane (2000: 73) noted,

²³³ This conclusion is based on the rule of evidence (see e.g., Keane, 2000: 90). Denning J held in *Miller v Minister of Pensions* [1947] 2 All ER 372: 374: "if the evidence is such that the tribunal say: 'we think it is more probable than not', the burden of proof is discharged, but if the probabilities are equal it is not."

the burden of proof arises from a presumption of law,²³⁴ and there is no presumption of abuse simply because the incumbent has market power. The entrant must prove consumer detriment and the causal relationship between the detriment and the incumbent's conduct. Once he has adduced sufficient evidence of that fact, the incumbent should bear the burden of proof – *omnia praesumuntur pro negante* (Paton, 1972: 600; see also Goyder, 2003: 315). The essentiality-justification mechanism also aims at a cost-benefit balance between the short-term and long-term goals. In the short-term, the entrant must show the social benefits of the MIE license. In the long term, for a refusal to license or other conduct that raise switching costs to be acceptable, the incumbent must prove that refusal to license is necessary to give him enough incentives to innovate.

5.5.2 THE IMBALANCE OF BURDEN OF PROOF IN ARTICLE 82 EC CASES

a. *Burden of proof under Article 82 EC*

For the time being, the burden of proof under Article 82 EC rests upon the claimant (the entrant or the Commission). Article 2 of the Council Regulation 01/2003 (OJ L-1/2003) states: “in any *national* or *Community* proceedings for the application of Article ... 82 of the Treaty, the burden of proving infringement ... shall rest upon the party or the authority alleging the infringement.”²³⁵ Under *Eurofix-Bauco v Hilti* [1989] 4 CMLR 677 (para. 68) and Article 27.2 of Regulation 01/2003, the incumbent (the respondent) has the right to defend, including the right to challenge the facts put across by the claimant, and the right to “objectively justify” the incumbent's conduct. However, neither the Commission nor the CFI has set out clearly what

²³⁴ Paton (1972: 602): “presumption of law is an inference, which the law direct from a specific fact (e.g., a child less than eight years old cannot be conscious about the legal consequence of his behaviour)... Presumption of fact is an inference the mind naturally and logically draws from given facts, irrespective of their legal effects (*res ipsa loquitur*).”

²³⁵ Nowadays Article 82 cases can be brought before national competition authorities and national courts (Regulation 01/2003, Arts. 5 and 6).

might count as objective justifications.²³⁶ Similarly, the ECJ in *Magill* also states that an exceptional circumstance arises if the intellectual property right holder cannot justify his exclusionary conduct (para. 54). Nevertheless, from *Magill* to *IMS*, the Court did not elaborate what might count as a legitimate justification (see Greaves, 1998 and Anderman, 2002). What is more, the Court did not impose on the incumbent the burden to justify his conduct. This is for the Court to analyse both whether the facility in dispute is ‘essential’ to competition in the downstream market, and whether the refusal to license of the incumbent is justifiable.

One may ask: if in Article 81 EC, there is a provision for ‘justification of anticompetitive conduct’ (Article 81.3); can we have a similar provision of justification for ‘abusive conduct’ under Article 82 EC? There has never been an answer to this question, but I understand that the idea of ‘justification for an abuse’ can be awkward from jurisprudence’s perspective. If an ‘abuse’ is justifiable, then it is no longer an abuse, but a legitimate use of a right. However, this argument is correct only if we know what is an abuse of a dominant position. Article 82 EC only provides a non-exhaustive list of what *may* become an abuse (*Tetra Pak II*, para. 37). Whether a conduct is in fact an abuse will depend on its effect to consumer welfare, and that is why the word ‘justification’ was used in *Magill*. If a definition of abuse can strike a balance between the pro-competitive and anti-competitive factors, then the defence is already implied in the definition. Therefore, the word ‘abuse’ should be defined as an ‘unjustifiable unilateral restraint to trade’. With that definition, the burden of proof in Article 82 EC cannot be imposed solely on the claimant. The entrant can prove consumer detriment from the incumbent’s conduct. He cannot justify the conduct at the same time. If the Court ‘justifies’ this conduct on the incumbent’s behalf, this approach may compromise judicial impartiality. Without imposing the duty to justify on the incumbent, once the evidence of consumer detriment has been furnished, the balance of interests between the consumer and the incumbent is therefore weak.

²³⁶ There is an implicit principle set forth by the CFI (para. 67) that a justification must be ‘relevant’ to the incumbent’s conduct, and such conduct must be ‘proportional’ to the justifiable reason, but this principle has not been made explicit. Neither ECJ in *IMS* (C-418/01) provides further clarifications on this point. In comparison, Judge Blackmun in *Kodak* (para. 54) also requires a justification of a monopoly conduct to be ‘relevant’ and ‘valid’, but his methodology to examine a justification is more accessible. He analysed all the consequences of each justification to the market, and considered whether such consequences would fit

As it is unclear what is the standard of justification and who should bear the burden to justify, the right of ‘objective justification’ in *Hilti* becomes more hypothetical than real. The ambiguity also risks a misconception that market share proves market power, and market power proves abusive conduct (*Media Market-Legal*, para. 5-19).²³⁷ Therefore, the main battle is to define the relevant market. According to Goyder (2003: 566), this methodology is contrary to the functions and the responsibilities of the Competition Commissioner (Decision 2001/462/EC, OJ [2001] L162/21), which requires him to take due account of all relevant facts, whether favourable or unfavourable to the parties concerned.

The CFI and the ECJ became aware of the asymmetry of the burden of proof in two cases *Tierce Ladbroke* [1997] ECR II-923 and *Oscar Bronner* [1998] ECR I-7791. However, they have faced a dilemma. On the one hand, the Courts must declare that a restraint of trade is an abuse. On the other hand, they have been concerned that by so ruling they would open a floodgate for rent-seeking litigation from the entrant’s side. However, the ECJ would not be willing to strike a balance between the burdens of proof of the parties. The Court rarely even reviews the fact of a case, simply because it has only 25 judges, not enough manpower to hear all cases involving EC law. Under Articles 20.8 and 31 of Regulation 01/2003, the ECJ does not have to review facts; it needs only to review the lawfulness of a Commission’s decision, or to guide a national court on how to apply the law. Thus, instead of using a procedural rule to balance out the burdens of proof, the ECJ has developed a controversial substantive rule to

with the aim set forth by the justification or consumer welfare. If the answer was negative, the ‘justification’ would be invalid. (See *Kodak*, paras. 47-56).

²³⁷ Whish, *id.*: 235, and Goyder (2003: 325). Although the respondent’s right of defence exists in the oral hearing, its impact on the Commission’s final decision is low and there is no basis to tell when a defence is acceptable. The respondent is not even informed of the deliberation between the Commission and the Advisory Committee before the final decision, see *Musique Diffusion Française v Commission* [1983] ECR 1825. Whish (2001: 234-35) further states that both the complainant and the respondent has the right to present their opinions during the oral hearing, before the Commission’s hearing officer. However, until 2001, the parties were not entitled to see the report of the hearing officer before the decision is made (see *ICI v Commission* [1992] ECR II-1021). See also the Commission’s decision of 23 May 2001 on reforms of hearing procedure, OJ [2001] L 162/21.

increase the standard of proof of an abusive refusal to license.²³⁸ Before *Magill*, the standard of proof is based on the existence/ exercise dichotomy (see *Consten and Grundig*, in section 2.3.1 above). From *Magill* onwards, the circumstances must be ‘exceptional’ for a refusal to license to be abusive. In the exceptional circumstances doctrine, the ECJ has introduced the concept of ‘reasonable demand’ (*Magill*, para. 52), but the Court failed to explain why a denial of demand made the case exceptional, and where the conditions in *Magill* come from.

Unlike the ECJ, the CFI can review the fact of a case if a party bring a *direct action* against a Commission’s decision (CFI Rules of Procedure OJ [1991] L 136, Art. 14). The CFI can strike a balance of burdens of proof if it wants to (*id*, Arts. 46 and 64). Instead, the Court had embraced the ECJ’s approach in *Magill*: praising substantive rules rather than procedural rules. One may argue that the CFI could not do anything else, because a balance of burden of proof is not introduced to the CFI Rules of Procedure (OJ [1991] L 136). However, these Rules do not prohibit the CFI to guide the parties as to the extent of proof each of them must show to the Court. If the CFI cannot accept this proposal due to the lack of human resources, then we hope a balance of burden of proof should be adopted in a competition investigation before the European Commission. Regardless of how a standard of proof has been increased in *Magill*, the CFI or the Commission cannot provide a balanced answer as long as the incumbent and the entrant do not have an equal chance to present their arguments.

b. The condition of ‘capacity to eliminate all competition in the market’

To raise the standard of proof further, the ECJ has narrowed the ‘exceptional circumstances’ doctrine again in *IMS* (C-418/01, judgement dated 29 April 2004). Before *IMS*, the third condition in the *Magill* doctrine is that the dominant undertakings “reserve to themselves the

²³⁸ Whish (2001): 282-283. In *Shearson Lehman v Watson* [1989] 3 CMLR 429: 570, Justice Webster in the UK High Court held that the standard of proof for an abusive conduct should be a higher degree of probability than in civil proceedings generally (balance of probabilities). At the same time, it should be lower than the requirement in a criminal case (beyond reasonable doubt). However, Justice Kean of the Irish High Court in *Masterfoods v HB Ice Cream* [1992] 3 CMLR 830: 873 stated that the standard of proof should be the same as that applies to other civil cases, i.e., balance of probabilities.

secondary market ... by excluding all competition on that market ... since it denies [competitors] access to the [essential facility]” (*Magill*, para. 56). In *IMS*, this condition becomes “the dominant undertaking is *capable to eliminate* all competition on the secondary market” (para. 47). Such a conclusion put other prohibitions of ‘hard core’ anticompetitive conduct, such as price cartel, at odd: even they cannot eliminate ‘all’ competition in a market, because some competitors may still survive notwithstanding the price cartel (Le, 2004a and *GVR*, para. 55). One can defend the *IMS* decision that if the incumbent cannot eliminate all competition in a market, then competition in such a market is still ‘workable’. This argument also ignores the detriment to consumers, as discussed in Chapters 3 and 4 above. The argument also contradicts the *Tetra Pak II* decision, which states: “the aim pursued [of Article 82], which is to maintain undistorted competition, rules out waiting until such a strategy leads to the actual elimination of all competitors” (para. 44).

The *IMS* decision also goes against the US approach, which only requires of proving an intention of the dominant undertaking to eliminate competition, without showing the capacity to eliminate competition (see section 1.1.3 above). In the most recent case, *Verizon* (2004) S.Ct. 872: 883, Justice Scalia (notorious for protecting the interests of large businesses, see Lessig, 2004: 247), only held that leverage of market power can be anticompetitive if it involves “anti-competitive conduct with ‘a dangerous probability of success’ in monopolising the second market” (Werden, 2004: 4). ‘Monopolisation’ does not mean the same as ‘eliminate all competition’ (see section 1.5.2 above).

5.5.3 TOWARD A BALANCED BURDEN OF PROOF

Anderman (2002) criticises the ‘exceptional circumstances’ doctrine for its ambiguity. This doctrine has mixed up two steps, which should be separated. Under the essentiality-justification mechanism, the first step should be for the entrant to prove that a facility is essential, and the second step is for the incumbent to prove that a refusal to license is justified even if the facility is essential. In the first step, whether a facility is essential is a matter of fact, not a question of law. Therefore, whether intellectual property rights protect such a facility would be irrelevant

to the consideration.²³⁹ Similarly, in the second step, whether a refusal to license is justified is also a matter of fact.

By accepting too easily that intellectual property rights justify refusal to license, one may negate the truth in other disciplines, such as computer science and economics. As Anderman (1998: 249) and Derclaye (2003) emphasise, so far no economic study has proved that intellectual property rights can strike a balance between private and public interests in all events. One not should not assume too easily that whatever is protected by intellectual property rights will serve public interests. When the assumption no longer holds true, the rightholder should bear some burdens of proof. Article 82(b) should treat ‘prejudice to consumers’ as a refutable presumption of law on abuse. That is, when consumer detriment is proved, there is a presumption of law that the conduct of the incumbent was abusive, which could be rebutted if the incumbent can counter-prove (Keane, 2000: 95-101, 634 on presumption). From the legal and philosophical standpoint, Habermas (1996) has also taken the position that the burden of proof under a principled discourse should be shared equally. In this discourse, “all interested parties [should have] equal opportunity to pressure, equal opportunity to influence one another during the actual bargaining, so that all affected interests have equal chances of prevailing” (*id*: 168). All stakeholders should have the right to voice their concerns in the public sphere and to convince others (*id*: 180).

Another support for the balance of the burden of proof originates from the theory of information asymmetry (see e.g., Stiglitz, 2001). Under this theory, the party who is most likely to have information should reveal it, so that the court could assess the situation before delivering the judgement. If we allocate the burden of proof to those who have information, those who bear the burden of proof must reveal, regardless of whether they are willing or

²³⁹ Gallini (in OECD, 2001a: section 3) argues that intellectual property rights protection, and even R&D costs, should be ignored in the first step of a EFD case. Instead, focus should be on how competition and prices in the market may be negatively affected against the consumers.

unwilling. A failure to provide information or to justify can be interpreted to mean that the party who bears the burden of proof does not want to reveal such information.²⁴⁰

The balance of burden of proof is also underpinned in Article 81(3) EC and the *rule of reason* under US antitrust law (see section 1.1.2.c). Under Article 81(3) EC, the incumbents who enter an anti-competitive agreement could be exempted from the competition law sanctions if such an agreement reduces the sunk costs and free riding risks; and if in the long term it would bring fair benefits to the consumers. However, the burden of proof is on the incumbents.²⁴¹

The scope of justification for alleged anti-competitive conduct in the US is even broader than that of Article 81(3) EC. By the rule of reason, an alleged practice should be exempted from competition law measures if its benefits to society are larger than its costs (see section 1.1.2.c). The ground of defence is not limited, as it was in the case of Article 81(3) EC. The burden of proof is shared equally not only in antitrust cases but also in the copyright fair use cases, as held in *Sony v Universal Studios* 464 US 417.²⁴²

²⁴⁰ The method of allocating burden of proof under the theory of information asymmetry is also called screening (Baird *et al.* 1994: 79-121). Screening is a method to incorporate beliefs (presumption) into the solution concept. When the incumbent has more information than the entrants, he will conceal information to have leverage against the latter. If the law presume that the incumbent has bad information (his conduct is abusive), he must prove that his conduct is not abusive to avoid sanction. By doing so, the parties reach a Bayesian equilibrium (an optimal status given the belief of the law).

²⁴¹ See *BP v Commission*, C-77/77 [1978] ECR 1513. To compare with the justifications under Article 81(3), see Section 5 of *Guidelines on Vertical Restraints*. The Commission noted that vertical restraints are exempted from Article 81 if they are applied to recover the incumbent's investment costs of establishing the distribution channels, or to prevent free riders. To avoid conflict between Articles 81(3) and 82 EC, the Commission usually refuses to grant individual exemption to anti-competitive agreements if they could otherwise be triggered by Article 82 (Whish, 2001: 133). Regretably, this approach is based more on procedural consistency than market efficiency.

²⁴² At para. 456, the Supreme Court states that the burden of proof that the fair use cause damages to the copyright owners is on the copyright owners. When the copy did not affect the author's incentive to create, one cannot say that it has affected the rightholder's normal exploitation. Note that balance of burden of proof is also underpinned in the decision of the WTO Panel in *US v European Union* WT/DS160/R (2001).

Whish (2001: 102) is sceptical whether the rule of reason could be transplanted to EC competition law. First of all, the ‘bifurcation’ of Articles 81(1) and 81(3) does not exist in the Sherman Act, and that EC competition law promotes a single market as well as with ‘conventional competition law concerns’. These however, are substantive arguments. They are hardly relevant to rebut the feasibility of the rule of reason, which is a procedural rule on the admissibility of evidence to be used as a defence. In addition, the balance of burden of proof will contribute to certainty, which is needed because a decision on abuse of a dominant position could lead to a heavy fine that substantially affects the incumbent.²⁴³

If balancing the burden of proof is the rule under US antitrust law and Article 81(3) EC, there is no reason why it cannot be applicable to Article 82 EC, given that no one is better than the incumbent in justifying his conduct. As Justice Learned Hand said in *Alcoa* 148 F.2d 416, “no monopolist monopolises unconsciously of what he is doing;” the incumbent can explain why his exercise is not abusive. Moreover, there should be consistency in policy between the defences under Articles 81 and those under Article 82. Otherwise, Article 82 may nevertheless catch conduct exempted under Article 81(3) (see *Tetra Pak I*, T-51/89, para. 21).

CONCLUSION

The main question in this chapter is whether innovation to the MIE is possible after the MIE license. If innovation is impossible because of the high risk of sunk costs and free riding, then the compulsory license should not be granted. Two approaches that can remedy these risks are the monetary incentives (finding a fair access price and stimulating cooperation with the entrants) and the time incentive (finding a period where refusal to license is acceptable). To put MIE control in context, the time incentive should be used as the last resort, because it has dual effects (positive to the incumbent, but negative to the consumers). As noted in sections 5.3.1 and 5.3.2, such an incentive can be implemented when the incumbent has not recovered the relevant *ex ante* sunk costs of the MIE network promotion (C) or the entrant cannot pay these

²⁴³ In EC competition law, the fine on violation of Article 82 EC could be up to 10 percent of the firm’s annual revenue (Arts 15 and 16 Regulation 17/62, OJ [1962] L 204/62).

costs. Otherwise, monetary incentives can be sufficient to generate motivation for innovation. A fair access price could be achieved by negotiation between the incumbent and the entrant, following the Rubinstein Bargaining model. In particular:

- 1) The law should allow the incumbent to set a minimum threshold of the access fee (so called Π , being the proportion of the *ex ante* sunk costs of the MIE promotion to be multiplied by the market share that the entrant intends to capture).
- 2) When the incumbent has received or recovered a minimum amount (Π), he and the entrant can negotiate for a fee for the MIE license, following the Rubinstein Bargaining model. To prevent the entrant from under-pricing the MIE, the incumbent should have the right to organise bidding for MIE access.
- 3) To prevent the risk of collective action in free riding, the court should allow the incumbent to cooperate with the entrant in R&D and to limit the number of entrants, which are capable to use the MIE to the consumer's benefit.
- 4) If the MIE access could endanger the incumbent's existence, the MIE license should not be granted.

The proposals in chapters 3, 4 and 5 are summarised in a procedural rule -- the essentiality-justification mechanism. A checklist of questions the essentiality-justification mechanism will be as follows:

- (1) Essentiality for granting access: does the consumer suffer direct or indirect detriment because of the increasingly high switching costs? Is access to the MIE the only feasible measure that can reduce the switching costs?

- (2) Justification: has the incumbent recovered its *ex ante* sunk costs? Can the court design a pricing mechanism akin to the Rubinstein model? Is there an incentive for continuous innovation in the aftermath of the MIE license?

After analysing the hypotheses forwards and backwards in chapters 3, 4 and 5, the next chapters will discuss the application of these hypotheses, especially the essentiality justification mechanism, to the essential facilities doctrine under US antitrust law, the exceptional circumstance doctrine under EC competition law, and the three-step-test under Article 13 TRIPs, through the cases already presented in sections 1.5 and 2.3 above. Although these doctrines are substantive rules and the essentiality justification mechanism is a procedural rule, they often lead to similar results. This fact is not surprising, as consumer welfare and cost-benefit analysis are the core of both the substantive rules and the procedural rule (see section 1.1.2.c). However, a procedural rule may provide a better insight than the current doctrines with respect to the refusal to license case.

CHAPTER VI: RETHINKING THE REFUSAL TO LICENSE CASES

Will the essentiality-justification mechanism provide insight into the refusal to license cases, which have been discussed in this thesis (*Magill*, *Volvo*, *Bronner* or *IMS* in Europe, *Kodak*, *Intel* and *Verizon* in the US)? So far, courts have decided these cases under the doctrine of ‘exceptional circumstance’ and ‘essential facilities’ (EFD, see section 2.3.1). The challenges to these doctrines have been introduced in section 2.3.2. Our task is to analyse whether the essentiality-justification mechanism can meet these challenges. This chapter argues that the EFD faces difficulties with refusal to license cases not because of its rationale, but because it has not been applied step-by-step. Firstly, courts need to assess the essentiality of the facility, not only for the entrants, but also for the consumers. Later, they must consider the justification for refusal to license on two grounds: sunk costs and free riding. As Goyder (2003: 307) notes, the ECJ while introducing the ‘exceptional circumstance’ doctrine in *Magill* has already highlighted these two factors. Unfortunately, it has put two parts together in one consideration, causing difficulty while applying to the context of intellectual property rights.

Using *Magill* and *Bronner* as examples, section 6.1 argues that the essentiality-justification mechanism can apply not only to the cases involving switching costs but also other cases involving refusal to license or an advantage of market power. Sections 6.2 and 6.3 will analyse the cases involving switching costs in Europe (*Volvo* and *IMS*) and the US (*Kodak*, *Intel* and *Verizon*) in light of the essentiality-justification mechanism. *Microsoft Europe*, although related to switching costs, has already been discussed in section 4.2.2. The structure of this chapter will follow the two steps of the essentiality-justification mechanism rather than traditional steps: market definition, dominance and abusive conduct. However, if we look at Figure 18 in section 4.4.1, we can see that ‘abuse’ is not a step in itself. It is a result of several steps, including ‘essentiality’ and ‘justification.’ Both steps aim at safeguarding competition on the merits. The

‘essentiality’ step identifies the market and the dominant position. The ‘justification’ step analyses whether the conduct in dispute is in fact abusive.

6.1 THE ESSENTIALITY-JUSTIFICATION MECHANISM AND REFUSAL TO LICENSE

The essentiality-justification mechanism is useful not only in switching costs cases, but also in other cases involving refusal to license intellectual properties. The ECJ held that a refusal to license an intellectual property in some ‘exceptional circumstances’ might amount to an abuse (*Magill*, para 50; *Bronner*, para 104). However it is unclear why *Volvo* had not been qualified for such ‘exceptional circumstances’, since on the face of it the incumbent’s conduct in *Volvo* and *Magill* has been the same.²⁴⁴ We cannot say that from the consumer’s perspective, a car front wing in *Volvo* is less essential than the combined television listings in *Magill*. In *Philips v Ingman* [1999] FSR 112, paras. 63-66, Judge Laddie has used the George Orwell’s language to explain inconsistency in these two cases: “not all intellectual property rights are equal. Some are more equal than others.” He noted at para. 64 that *Magill* was an exception of the *Volvo* principle: “if a party is to rely on *Magill* ... (he must prove) the exceptional features which take the case outside *Volvo v Veng*”. This ambiguity indirectly recognises the *Volvo* principle that an exercise of intellectual property rights is not an abuse, and the real reason behind *Magill* was that the scope of copyright protection in the UK has been too broad (see Treacy, 1998: 505 and Greaves, 1998).

My argument is that *Volvo* is different from *Magill* not because copyright is ‘less equal’ than industrial design or patent. A competition court has no jurisdiction to rule on intellectual property matters (Article 235 EC). The problem arises because the ECJ did not separate the two issues: whether the facility is essential for the consumers, and whether the incumbent could justify its refusal to license. Both issues are the matters of fact. As a matter of law, intellectual property rights, similar to property rights, will be limited when they are used to harm the others

²⁴⁴ Volvo is the holder of industrial design for its wing panel. Erik Veng, a spare part manufacturer sought license to produce the wing panel, so Volvo car users can buy equivalent products at a lower price. Volvo refused to grant license. Veng then brought a lawsuit against Volvo for abuse of dominant position. By refusing to grant license to Veng, Volvo practically monopolise the spare parts market for Volvo cars.

(see section 3.1.2). Below *Volvo*, *Magill*, *Ladbroke* and *Bronner* will be used as examples to show that the essentiality-justification mechanism can be a solution to the ambiguity of the ‘exceptional circumstances’ doctrine.

6.1.1 THE ESSENTIALITY OF MIE ACCESS

The first step of the essentiality-justification mechanism is for the entrant or the competition authority to prove that the MIE is essential for the consumers. *Tierce Ladbroke* [1997] ECR II-923 and *Bronner* [1998] ECR I-7791 could be an illustration on how an essential facility for the entrant is different from an essential facility for the consumers.²⁴⁵ Although in both cases the ECJ has rejected the application of the EFD, it has done so because the facility has not been essential for the entrant, not because it has not been essential for the consumers.²⁴⁶ In *Bronner*, AG Jacobs noted that *Magill* was exceptional because “the balance of interests swung in favour of the licensee.”²⁴⁷ Nevertheless, the explanation still gives an impression that the ‘essentiality’ is judged from the perspective of the entrant, not the consumer. Many entrants believe that the issue of the EFD is to convince the court that their case is exceptional, because if they do not have access to the facility, they would be driven out of the market. This is not the point. The

²⁴⁵ The fact of *Bronner* is follows: the defendant (Mediaprint) controlled the nation-wide home delivery network for daily newspapers. The plaintiff (Bronner) – newspaper’s publisher, asked Mediaprint access to the network against remuneration but was refused. Bronner then sued Mediaprint before Austrian court, alleging that the latter has abused dominant position and refused to supply Bronner an essential facility, as the home delivery network of Mediaprint is the only one in Austria. This issue submitted to the ECJ. The Court dismissed Bronner’s claim, as the distribution network is neither an essential facility for Bronner in technical sense.

²⁴⁶ For example in *Ladbroke*, the applicant complained that a refusal by a French broadcaster the re-transmission of the French horse races in the applicant’s betting shops in Belgium as an abuse. The CFI has rejected this claim and made distinction between *Magill* and *Ladbroke*. In *Magill*, the applicant was effectively barred from entering the downstream market. In *Ladbroke* the applicant was already in the market. *Ladbroke* still provided services to its consumers, thus the license was not ‘essential’ to it.

²⁴⁷ Opinion of AG Jacobs in *Bronner*: 47 and 63. Firstly, television listings are not copyrightable in other Member states except UK and Ireland. Secondly, there is a demand for a new product (combined television guide) in the market. Thirdly, the copyright created a permanent barrier to entry of the new product. The useful life of a television guide is one week, compared to 50 years in copyright term.

report from OECD (1999: 162) reminds: “it is not relevant if an asset is essential to an entrant, but rather the issue should be whether the entry is essential to increasing consumer welfare.”

To put consumers into context, the issue should be the effects of the refusal to the consumers and related factors, such as the consumer utility surplus (ΔU) and the consumer switching costs (S). In *Bronner*, the ECJ held that the facility (the journal distribution network) was not ‘essential’ to Bronner. This is true, but the correct answer should have been that the EFD was not applicable because the facility was not essential for the consumers’ interests (there is no ΔU at stake). Otherwise, we cannot understand the differences in the outcomes of *Magill*, *Volvo* and *Bronner* whereas their material facts are the same. In the recent order (*IMS v Commission* - C-481/01 PR, para. 145), the ECJ has begun to raise a concern that the EFD may “equate the interests of downstream competitors with the interests of consumers.”

Returning to *Volvo* and *Magill*, we can see why the two cases are different, by using the essentiality-justification mechanism. The facilities at stake in both cases have been essential for consumers. However, in *Volvo*, Veng could not prove that it would bring a utility surplus to the consumers (ΔU). The ECJ has created another confusion when it noted that the refusal to grant intellectual property rights would amount for an abuse if Volvo’s price were ‘unfair’. In comparison, US law does not condemn ‘unfair’ price, only ‘price fixing’ (see *Verizon*, section IV). Using the essentiality-justification mechanism, my argument is that Volvo needs not explain why the price for its spare part is ‘unfair’. The issue is not how high Volvo had charged consumers,²⁴⁸ but how low Veng could charge the consumers or how much higher the quality of Veng’s product compared to Volvo. Only by so doing Veng can solicit consumer demand (ΔU) and prove that Volvo’s license is essential for the consumers. Only after Veng can show an appreciable demand for its product, Volvo must justify its refusal to license.

²⁴⁸ *Volvo.*, at 9: “a higher price for the patented product ... does not necessarily constitute an abuse. ... The inventor is entitled to recover ... his research and development expenditure; and high price might be necessary to provide a return on the amounts invested in order to protect the protected design.”

6.1.2 JUSTIFICATIONS FOR REFUSAL TO LICENSE

As noted, the obligation to justify the refusal to license only arises when the facility is essential for consumers. The difference between *Volvo* and *Magill* is not only on the essentiality of the facility but also on the justification of the entrant on two grounds. These are sunk costs and free riding. Table 8 below presents *Volvo* and *Magill* from the perspective of the essentiality and justification mechanism.

Table 8: Volvo and Magill under the essentiality-justification mechanism

ESSENTIALITY-JUSTIFICATION MECHANISM		<i>Volvo</i>	<i>Magill</i>
ESSENTIALITY OF THE FACILITY TO THE CONSUMERS	<i>Relevant Market</i>	Volvo's spare parts	BBC, RTE and ITV's TV listings
	<i>Essential facility</i>	Car front wing panel	TV listings
	<i>High switching costs and market power?</i>	Yes (cost of purchasing a new car)	Not applicable
	<i>Utility surplus from the new product?</i>	Unclear (Veng has not proved this point)	Yes ('new' product)
	<i>Is reasonable demand not satisfied?</i>	Unclear (Volvo has also supplied front wing panel)	Yes (BBC and RTV do not provide the combined TV listings)
JUSTIFICATION	<i>High sunk costs in relevant markets</i>	Yes	No (the main business of BBC is broadcasting services).
	<i>Access encourages free-riding</i>	Possibly (see below)	No
ACCESS	<i>Grant access to the facility?</i>	No	Yes

In both cases, the incumbents had power in the markets for downstream products or services. However, in *Magill*, the incumbents, the broadcasters, had no justification for their refusal to license. Neither the cost of creating the TV listing, a by-product, was high; nor the entrant was a free rider. *Magill* has provided a product that the incumbents did not supply. In *Volvo*, Veng only wanted to supply the consumers the same product that Volvo was supplying, where there was no evidence that the consumers were suffering losses from being charged an 'unfair price'.²⁴⁹ In addition, Volvo could show its sunk costs in developing the car market,

²⁴⁹ See also *CICRA v Renault* [1988] ECR 6039. Note that the ECJ has not yet developed a clear methodology to judge what a fair price is.

which contributed to the establishment of the market for Volvo car's wings. These had not been shown in this case. Had the court struck a balance between the costs and benefits to the consumer on the one hand and the risk of free riding on the other, Veng would have appeared to be a free rider in a 'competing but non-innovative' market (see section 5.1.3).

6.1.3 DIFFERENT APPROACHES TO THE INNOVATIVE AND THE NON-INNOVATIVE MARKETS

Some commentators have placed emphasis on the fact that Magill had provided a new product, as opposed to Veng who had not (Furse, 1996; Overd and Bishop, 1998; and Turnbull, 1998). In reality, 'new product' is not the only acceptable factor. The judgement in *Magill* on the 'new' product condition was to fit a square peg into a round hole, pretending that Magill's product (a combined TV listing) is 'new' (C-241-242/91, para. 57). In terms of technology or creativity, Magill's combined TV listing was nothing 'new' or innovative. It was a combination of obvious ideas. Magill's product simply provides the consumers more utility surplus than the incumbent's products. Such pretence is unnecessary. As discussed in section 3.2.3, there are two types of consumer demand: the demand for a new product in an innovative market and the demand for the same product at a lower price in a non-innovative market. In the later case, the entrants need not prove that they have created a new product if they can provide a surplus to the consumers.²⁵⁰ Unfortunately, by using the word 'new', the ECJ has created a misunderstanding that a product is supposed to be new in order to provide a consumer surplus.

When the market is innovative, the 'new product' condition is a prerequisite. In *Bronner*, the entrant has argued that had it been supplied the distribution network of Mediaprint, it could have served the consumers better. We do not know whether it was true in fact.²⁵¹ However, for

²⁵⁰ In all essential facilities case in the US, such as *Terminal Railroad, MCI v AT&T, Aspen Ski*, or *Commercial Solvents*, proof of "new product" is not required. For supporting arguments, see Ridyard (1996) and Fine (2002).

²⁵¹ The legal questions in *Bronner* has been referred to the ECJ under Article 234 EC, thus the Court has not been asked to give a judgement on the facts but to explain the law. However the Court did not follow the Article 234 procedure and went on to decide the case, without re-examination of the evidence. We need to acknowledge that the full fact of the case is unknown, see Monti (2003).

this argument to be relevant, it must be put in context, namely the market. If the market for news (where Bronner has been operating) was non-creative or non-innovative (like *Magill* and *IMS*), that is one thing. However, companies compete in this market by the quality of their news and reports, which requires innovation and creativity. If there is a demand for innovative or creative products, Bronner should satisfy such a demand before asking access to Mediaprint's network. Unless Bronner could have proved that the distribution network is essential for the consumers' interests, Mediaprint would not need to justify its refusal to supply. This situation is different from *Magill*, where the market for TV listing has been a non-innovative one.

6.1.4 RECOMMENDATIONS TO THE DOCTRINE OF 'EXCEPTIONAL CIRCUMSTANCES'

When a refusal to license is dealt with in two steps: (1) whether a facility is essential for the consumer and (2) whether the refusal to license is justified, the EFD will be less ambiguous. The ECJ has noted two important conditions in the exceptional circumstances doctrine ('essentiality, no-substitution' and 'no-justification', see e.g., Goyder, 2003: 307). Regrettably, the Court has not separated them into two steps but has followed an 'all in one' approach. In doing so, the ECJ has created a false impression that the circumstance in *Magill* was special because the scope of copyright in this case was too broad. Consequently, Govaere (1996) has argued that copyright law, not competition law, needed to be reformed. The application of the EFD becomes more unpredictable and a belief that the EFD is difficult to apply to the intellectual property cases is entrenched. A feasible EFD should (1) treat innovative markets differently from non-innovative markets, (2) separate the consideration of whether a facility is 'essential' from the question whether the refusal to license is 'justified,' and (3) allocate the burden of proof to the party that has the most information in a relevant matter.

6.2 ESSENTIALITY AND JUSTIFICATION IN THE EC SWITCHING COSTS CASES

6.2.1 *IMS* AND *VOLVO*

After analysing the use of the essentiality-justification mechanism in a general context, we will now apply this mechanism in the switching costs cases. The typical cases involving

switching costs and refusal to license in Europe are *IMS Health* and *Volvo* (see sections 2.3.1 and 3.3.5). In both cases, the relevant markets are non-innovative. That is, the consumers do not want a ‘new’ product, but a product that ‘must fit’ and ‘must match’ certain standards (see *British Leyland v Armstrong* [1986] 2 WLR 400). In *Volvo*, the essential facility was the design of the car’s front wing; in *IMS* it was the 1860 brick structure. If the cases are similar, the outcome should also be the same. Why has the Oberlandesgericht Frankfurt am Main allowed *IMS*’s competitors to use the essential features of *IMS*’s data formats in selling their products (see section 1.5.3.b), contrary to the outcome to *Volvo*? If we compare *Volvo* with *IMS* from the perspective of the essentiality-justification mechanism, the difference is apparent.

Table 9: *IMS* and *Volvo* under the essentiality-justification mechanism

ESSENTIALITY-JUSTIFICATION MECHANISM		CASES	
		<i>Volvo</i>	<i>IMS Health</i>
ESSENTIALITY $S > MAX \Delta U$	Relevant Markets	Spare parts	Pharmaceutical database
	Essential facility	Design	Data format
	High switching costs?	Yes	Yes (see consumer survey)
	Utility surplus from new product to consumers?	Unclear	Yes (see section 3.3.3)
	Does the incumbent satisfy the consumer demand?	Unclear	No (consumer demand for the entrant’s products exist)
JUSTIFICATION	High sunk costs not yet recovered?	Unclear	No (the format exists since 1960s).
	Free riding entrants?	Yes	Unlikely (entrant is willing to pay for access).
ACCESS	Grant access?	No	Likely

Volvo is different from *IMS*, because the product of *IMS*’s competitor (NDC) can provide utility surplus to the consumers and has in fact attracted a number of customers in a short period of time (Decision 2002/165/EC, para. 20; *IMS Opinion*, para. 39).²⁵² Such a surplus needs not present in a ‘new’ product, but simply a ‘better’ product, either in price or in quality – depending on the consumer demand. As explained in sections 1.5.3 and 4.1.1, it is not difficult to produce a new pharmaceutical data format, but it is impossible to market it, as the market for

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In this case, NDC has proved that its product is in many respects better than *IMS* products: there is a wider spectrum of data, on-line access is offered and the significant value of the data is greater and they are presented in a more customer-friendly manner.

pharmaceutical database in Germany has become non-innovative and the consumers are only interested in the formats compatible with IMS formats. NDC has passed the ‘essentiality’ test, whereas Veng in *Volvo* had not. Had Veng proved that his product would reduce the price of spare parts for the consumers significantly, it would have passed the essentiality test.

As for the justification test, the incumbent in *Volvo* may have a legitimate concern on sunk cost recovery, whereas in *IMS* the 1860 brick structure has been developed in 1960s, arguably long enough to recover any R&D sunk cost in a data format. Similar arguments can be said about the free riding risks (see section 6.1.2 above). Here *IMS* cannot raise the sunk costs argument. The cost of creating data structure is small compared to the cost of collecting the data. *IMS* may not be able to prove that NDC and AnzyX are the free riders because they are ready to pay license fees for using the *IMS*’s data structure. Similarly, it is unreasonable to ask NDC and AnzyX to be innovative in order to prove that they are not free riders, because the data structure is unchangeable, even for *IMS*, due to the large switching costs.

Another difference between *IMS* and the other EFD cases is the lack of an upstream-downstream relationship (see e.g., Temple Lang, 2003). Unlike *Volvo*, *IMS* has no upstream-downstream structure, thus the grant of access would directly affect the incumbent’s core interests. Commenting this fact, Fine (2002:7) argues that the upstream/downstream structure that the ECJ has relied on so far was a fiction. *Volvo* has dealt with an upstream-downstream structure, but it does not represent the only relevant circumstance.²⁵³ In both cases, the interests of the incumbent are affected (see section 5.1.3).

²⁵³ See *Commercial Solvents* [1974] ECR 223, para. 22: “An abuse of dominant position on [the essential facility] may have effects restricting competition in the market on which the derivatives of the [essential facility] are sold, ... even if the market for the derivative does not constitute a self-contained market.”

In the judgement dated 29 April 2004 (C-418/01), the ECJ has recognised the role of switching costs in erecting consumers' barriers to exit (para. 30).²⁵⁴ However, two of the three points made above was not accepted by the ECJ, namely vertical integration and non-innovative market. With respect to the justification test, the Court only briefly mentioned in para. 51 that "it is for the national court to examine, if appropriate, in light of the facts before it, whether the refusal of the request for a license is justified by objective considerations"; a conclusion too vague to be helpful for national courts and businesses.

6.2.2. VERTICAL INTEGRATION NECESSARY FOR A SWITCHING COSTS CASE?

With respect to the vertical integration, the Court still confirms its necessity, but "it is sufficient that a *potential* market or even *hypothetical* market can be identified ... where the products or services are indispensable in order to carry on a particular *business* and where there is an actual *demand* for them on the part of [the entrants]" (para. 44). This reasoning is difficult to follow. First of all, a market has to be defined by products and geographical area, not by 'business' (see section 1.5.1). By accepting the ECJ's logic, we would be forced to conclude that a market for operating systems can be subdivided into many markets depending on the businesses (i.e., the functions) that an operating system offers. Secondly, the demand that constitutes a market is the consumer demand, not the entrant's demand (see *Hugin*, para. 5; *Magill*, para. 52; and section 1.5.1 above). Thirdly, if a market is identified even if it is 'potential or hypothetical', only for the sake of the vertical integration requirement, can we say that the requirement itself is a fiction? Moreover, the Court further requires the entrant to show that the refusal to license is 'capable to eliminate all competition' on a secondary market, a condition not asked by the Oberlandesgericht Frankfurt am Main (see C-418/01, paras. 17 and 47). As argued in section 5.5.2.b above, this condition does not solve the issue at hand: detriment to consumers.

²⁵⁴ As this section was drafted, the *IMS* case was pending before the ECJ. I have argued that the ECJ should pay attention to the switching costs. If this factor was taken into account, the consumer detriment would be readily demonstrated and the *IMS*'s conduct would be held anticompetitive. This argument has already implemented by the ECJ, therefore its discussion is no longer necessary.

In *IMS*, the ECJ has defined the relevant market as the market for ‘German regional sales data for pharmaceutical products’ (*id*, para. 46). However, this is the same and the only market that IMS was involved, and is the subject matter of the case. How can we say that NDC products are new in this market? The Court has given no answer, leaving this impossible task for the German court. As noted in 1.5.2, the essence of vertical integration is in the concept of leverage of market power, but such a power can also be leveraged from a hidden tactic: instead of controlling a market, the dominant firm will control a crucial component in such a market. The change of the tactic does not change its effect: elimination of competition by keeping high switching costs of consumers. Without focusing on the core, both the EFD and the leverage theory may become inflexible to adapt with the change of circumstances. This inflexibility has caused confusion. Prior to the judgement, AG Tizzano said that: “refusal to license may be deemed abusive only if ... [the entrant] intends to produce goods or services of a *different nature* which, *although in competition* with those of [the incumbent], answer specific consumer requirements not satisfied by [the incumbent]” (*IMS Opinion*, para. 62). The emphasised words of this sentence conflicts each other. How could the entrant’s goods or services compete with the incumbent’s ones, if the former are of different nature from the latter? If one product is in the upstream market and another product is in the downstream one, as the Court believes a case of refusal to license case should be, then these products cannot compete with each other.

Admittedly, when the incumbent and the entrants are competing in the same market, granting access to the MIE may increase the risks of sunk costs and free ridings. However, as argued in Chapters 4 and 5, high risks do not result in access denial, because there are always two ways to address the risks: the time incentive and the monetary incentives. The issue is whether the risks are adequately addressed. The ECJ may consider striking a balance between the future risks of the incumbent and the current detriment of the consumers to see which amount is larger. The techniques of risk assessments have been discussed in Chapters 3 and 4. In a non-innovative market, such as *IMS*, such risks would be less probable than in an innovative market, as seen in section 5.1.3.

6.2.3 SWITCHING COSTS AND NON-INNOVATIVE MARKETS

In the judgement dated 29 April 2004 of *IMS*, the ECJ has recognised that switching costs has established a ‘financial obstacles’ to the entrant to enter a market (see section 3.3.3 above). However, the Court has failed to see that switching costs have made consumer’s demand become static and the relevant market becomes non-innovative. The ECJ still requires that the entrant who seeks access to an essential facility must provide a ‘new’ product not offered by the incumbent, without considering what might constitute a ‘new product’ in the market for regional sales data for pharmaceutical products.

By requiring the product offered by the entrant to be ‘new’, the ECJ assumes that any time an undertaking uses intellectual property rights to control a non-innovative market; entrants should be locked-out, notwithstanding the demonstrable consumer detriment. *IMS* has argued that licensing the data structure to NDC would cut-off the only source of revenue for *IMS*.²⁵⁵ This argument has not denied that it is exploiting the economic rent from the consumers’ switching costs. In addition, this argument is not an excuse for the refusal to license where consumer detriment is at stake. At best, it may become a justification that allows *IMS* to charge a high royalty for the license. The access fee will have to be negotiated with the entrant, by the Rubinstein Bargaining model, as argued in section 5.3.1 above. By labelling any ‘downstream’ market involving intellectual property rights as ‘innovative market’, the Court has readily assumed that the entrant is free riding simply because it has satisfied consumer demand in this market. Further analysis on the market characteristics is therefore desirable.

6.3 ESSENTIALITY AND JUSTIFICATION IN THE US SWITCHING COSTS CASES

The EFD in the US has been applied in many cases, notwithstanding the denial of Justice Scalia from the Supreme Court (see section 2.3.1 above).²⁵⁶ Referring to *Aspen Skiing v Aspen*

²⁵⁵ In case T-184/01 R, *IMS* argued that if it must share its copyright, its service, painstakingly developed over many years, would be devalued into a generic offering indistinct from the competing services.

²⁵⁶ See e.g., *Int’l Logistics Ltd v Chrysler Corp.* 884 F.2d 904 (parts for Chrysler cars); In Re *General Motors* 99 FTC. 464-554 (GM car parts); *Heattransfer Corp. v Volkswagenwerk A.G.*, 553 F.2d 964 (VW car parts).

Highland Skiing [1985] 472 US 585, Justice Scalia only held that “under certain circumstances, a refusal to cooperate with rivals can constitute anticompetitive conduct and violate section 2 [of Sherman Act].”²⁵⁷ The words ‘certain circumstances’ can give us an impression that the US solutions to refusal to deal is similar the to the ‘exceptional circumstances’ doctrine. That is not so if we consider the judgement of Justice Blackmun for the Supreme Court in *Kodak*.²⁵⁸

6.3.1 KODAK: APPLICATION OF SWITCHING COSTS TO A NON-INNOVATIVE MARKET

Kodak held patents and copyright in the spare parts of its copy machines. Independent service organisations (ISO) requested Kodak to supply its parts to repair Kodak copy machines, but had been refused. The issue was whether the service market for Kodak’s copiers and the copiers’ market are separated from each other. Kodak had argued that these markets are fully integrated into one package. The Supreme Court has rejected this argument, holding that the sale market and the service market are separated. This was because the consumers in this market were very different from those who have bought other copiers. In the service market, Kodak’s spare parts were the essential facilities for the independent service organisations (ISOs), which wanted to provide services for Kodak’s copiers (see section 3.3.3 above). Justice Scalia dissented, on the grounds that Kodak did not hold dominant position in the primary market and therefore did not fit with the leverage/refusal to supply cases (para. 56). However, Mr Justice did not pay attention to switching costs; and therefore did not see the detriment to

²⁵⁷ In *Aspen*, Aspen Skiing Co. (‘ski’) owns two downhill skiing resorts and Aspen Highlands Skiing Corp. (‘Highland’) owns two highland skiing resorts. During 1970s, two companies co-operated to sell single tickets for tourists. In 1980 the co-operation dissolved due to the dispute between the parties on the share of profits. Tourists latter were keen to buy tickets of Ski than of Highland. Highland sued Ski for violation of Article 2 Sherman Act. Ski alleged that it has no obligation to co-operate with Highland. The Supreme Court held for Highland, for Ski has abused its market power in coercing Highland in their business. Although the essential facilities doctrine was not directly used as the anti-competitive intention of Ski was clear, this case was mentioned in many reports as a good example of the doctrine.

²⁵⁸ *Eastman Kodak Co. v Image Technical Services* [1992] 504 US 451. Kovacic and Shapiro (2000: 50 and 56) refer to *Kodak* as “the most important judicial use of game theory, the economic of information and transaction cost economic.” Although the Supreme Court did not refer to the EFD in the *Kodak* judgement, it was referred to as an EFD case in later judgements, such as *Intel* (see below).

consumers. In this case, the detriment was apparent, as Kodak has set a higher service fee than the ISOs did.

Had Kodak been judged under the essentiality and justification mechanism, we can see that the ISOs would satisfy the reasonable consumer demand: they want to provide the services to the consumers at a lower price. Kovacic and Shapiro (2000: 57) criticise this argument, as the ISOs had not contributed anything to the innovation of copier machines. However, this challenge is unreasonable. As noted in section 3.2.3, the market for service of Kodak copiers was not an innovative market, due to the 'must-fit' and 'must-match' conditions between different parts of a machine (low $Max \Delta U$) and the high switching costs involved if the consumers decide not to use Kodak's services (S). The lock-in formula $S > Max \Delta U$ has therefore been fulfilled to show the essentiality of the facility. Kodak has also failed to justify its refusal on the grounds of sunk cost and free riding, because the ISOs were willing to pay for Kodak's spare parts, although they did compete with Kodak in the service market.

The majority of Supreme Court in *Kodak* has also recognised the compatibility requirement and the necessity to supply the consumer demand in the downstream markets. The Court has denied the 'innovation defence' when there has been no causal relation between intellectual property protection and the consumer utility surplus in the downstream market. *Kodak* is also remarkable when the US Supreme Court has confirmed that the market for Kodak services was separated from the market for photocopy machines. The Court has 'unbundled' Kodak's attempt to integrate the two market layers through its spare parts, where such integration would probably be more detrimental than beneficial to the consumers. In addition, unlike the ECJ decision in *Magill*, the *Kodak* principle applies even when the incumbent and the entrants are competing in the same market. Justice Blackmun had also rejected Kodak's argument that its buyers must have realised the lock-in before purchasing Kodak's products (paras. 33-36). If this argument were to be accepted, then not only Kodak but also any machine producer would have been given a blank cheque to abuse the locked-in consumers in any way they want.

6.3.2 INTEL: APPLICATION OF THE ESSENTIALITY-JUSTIFICATION MECHANISM

The duty to supply essential facilities in *Kodak* has been narrowed by the Federal Circuit in *Intergraph v Intel* [1999] 195 F.3d 1346. Intel was the world's leader in manufacturing computer-processing units (microprocessors or CPUs). Its CPUs (central processing unit) were the essential facilities for the downstream producers: manufactures of personal computers, software or graphics chips.²⁵⁹ These producers must have access to the technical data about the CPUs in order to develop interoperable products (195 F.3d 1346, at 1351). Intergraph was a major manufacturer of graphic subsystems. In 1994, Intergraph sued Intel for patent infringement in one of its inventions. In response, Intel has threatened Intergraph that it would withhold CPU information to Intergraph unless the latter withdraw its litigation. Intergraph brought an antitrust lawsuit against Intel, claiming, among other things, that by withholding CPU information to the downstream producers, Intel has attempted to monopolise the downstream market.²⁶⁰ The fact of this case is a typical switching costs problem, in which Intel's customers, producers of graphic subsystems were 'locked in' with Intel's standards. At the first instance ([1998] 3 F. Supp.2d 1255) the District Court of Alabama held for Intergraph, based on the precedent of *Aspen Ski* [1985] 742 US 585.

The Federal Circuit reversed the District Court decision in *Intel v Intergraph* [1999] 195 F.3d 1346, based on three reasons. Firstly, the Court held that intellectual property law and antitrust law are complementary, therefore the concept of monopolising should be viewed cautiously (*id.*, at 1361). Secondly, the EFD can only be applied if there is a competitive relationship between Intel and Intergraph, which had not been the case (*id.*: 1356). *Intel* has been distinguished from *Aspen Ski*. In the latter, the incumbent must continue granting access of a facility to its partner. Thirdly, in *Intel* Intergraph has request access to the future technical

²⁵⁹ The Court used the words 'technical data', a broader term than 'interface'. See also *Data General Corp. v Grunman Systems Support Corp.* 36 F.3d 1147 (1st Cir. 1994).

²⁶⁰ [1999] 195 F.3d 1346, at 1358. Intergraph also brought other claims on unconscionability and undue influence, that Intel was withholding information from Intergraph in order to force Intergraph provide Intel with free licenses to Intergraph patents.

data, while in *Aspen Ski* the dominant firm had only provided access to a pre-existed facility (a multi-access ski ticket).²⁶¹ However, these reasons are difficult to follow.

- 1) As noted in section 1.3.3, intellectual property rights and antitrust policy complement each other, but this argument is irrelevant in the graphic chips market, where Intel had neither innovated nor participated. In fact, Intel's refusal to license impedes the innovation incentives of Intergraph.
- 2) The difference between the future technical data (*Kodak*) and the existing facility (*Aspen Ski*) is superficial. As Goyder (2003: 296) comments on the *Commercial Solvent* judgement, the essentiality of the facility depend on the usefulness of the facility, not on what it is. Notwithstanding the differences between *Aspen* and *Intel*, the facilities in both cases were essential for the consumer.
- 3) The requirement of a competitive relationship between Intel and Intergraph conflicts with the first challenge. If Intel had not competed with Intergraph, how could a refusal to license be useful as an exercise of intellectual property rights? Such a refusal would not give Intel any tangible benefit in terms of incentives to innovation, but merely an exercise of its advantage on Intergraph.

Instead of re-inventing a new test, the Federal Circuit could have done a better job by applying the essentiality and justification mechanism. With respect to the essentiality test, the court could have asked whether access to the CPU technical data had been essential for the consumers. Intel might have refused access for Intergraph, provided that it would still provide access for other motherboard producers. In this case, the consumer's interests in having a competitive market for motherboards could not be affected. Since Intergraph would fail the essentiality test, the court needs not consider the justification test further.

²⁶¹ In *Northern Pacific Ry. Co. v United States* (1958) 356 US 1 and *American Key Corp.*, 762 F.2d: 1578, the courts ruled that antitrust law does not compel a company to do business with anyone.

Applying the essentiality-justification mechanism, Intergraph would have presented its case better by showing the essentiality of the Intel's technical data to the consumers. For example, if Intergraph were one of the largest producers in the downstream (subsystem graphic) market, the refusal to license would have generated switching costs for the Intergraph's customers as they have to replace the Intergraph's standard with another standard. To prove his arguments however, it is necessary to conduct a survey on the Intergraph's standard and the consumer demand on maintaining this standard (see section 4.4.2 above).

To conclude, while *Kodak* has focused on the core of the doctrine (consumer welfare), the Federal Circuit in *Intel* has paid too much attention to the phenomenal facts (future/current facility). Even if we consider long-term innovation as the Federal Circuit did, the issue about the current and the future facilities remains irrelevant as Intel and Intergraph did not compete in the same market. Our argument is that the sunk cost and free-riding risks should be considered on a case-by-case basis; not by an assumption that an object would justify the refusal to license if it is protected by intellectual property rights.

6.3.3 VERIZON AND THE FORMULA $MIN S > MAX \Delta U$

The dispute in *Verizon v Trinko* [2004] 02 US 682 concerns the implementation of the US Telecommunication Act 1996, which required a network incumbent, in this case Verizon Communications, Inc., to provide the entrants, in this case AT&T, with access to individual network elements (47 USC § 251(c), see section 3.3.5.b above). Verizon did provide AT&T with access, but inadequately and discriminatorily against AT&T customers. A customer of AT&T sued Verizon for the violation of both the 1996 Telecommunication Act and antitrust law, under the EFD. The District Court held for the plaintiff and the Second Circuit reinstated the antitrust claim. The Supreme Court reversed this judgement. The Court noted that the EFD should be exercised with care, so that it did not harm the incentives to innovate. The doctrine should be operable only when there was no access to the facility, not when such access has been inadequate or discriminatory. It was not unusual that the incumbent has treated its customers better than it has treated the customers of its rivals. Otherwise, the court could "lessen the incentive ... to invest in economically beneficial facility."

The concern about the incentives to innovate is legitimate. However, as argued in section 4.3, in a market with high switching costs, an intentional raising of the consumers' switching costs also harms the incentive to innovate. If the law is concerned about the development of competing standards, it should reduce switching costs, so that the new standards can tap to a pre-existed consumer base and recover its R&D costs. In *Verizon* switching costs were not the main issue, as consumers in AT&T network could interconnect with Verizon's network. Admittedly, Verizon has discriminated AT&T customers, discouraging its customers from switching to AT&T's network. However, as noted in section 4.2.2 above, the discrimination of Verizon alone cannot judge whether the formula $Min S > Max \Delta U$ has been proved. AT&T may arguably increase ΔU by lower its tariffs or provide better services to its customers than Verizon does, to the extent larger than the hurdles caused by Verizon. This case is different from *Microsoft Europe*. From the fact of the case, it is unclear whether the discrimination of Verizon affects the ability to innovate of AT&T.

It is also unclear whether Verizon's discrimination has created detriment to AT&T customers. Verizon should have the right to compete with AT&T. If because of discrimination AT&T consumers suffer loss of some legitimate interests, then Verizon's conduct has been abusive. This has not been the case. Verizon's obligation to grant access to AT&T is a result of the 1996 Act. The objective of this Act, as a sector-specific regulation, is to *create* competition rather than to *protect* competition (see sections 2.4.1 and 3.3.3.b). Therefore, the scope of competition created is defined by the sector-specific regulation, not by competition law.

Verizon was correctly decided not because of the failure of the EFD, but because the issues raised by the complainant are irrelevant to the question of abuse, particularly from the perspective proposed in this thesis: switching costs and the essentiality-justification mechanism.

CONCLUSION AND RECOMMENDATIONS

This chapter has applied two hypotheses from the previous chapters, switching costs and the essentiality-justification mechanism, to the 'exceptional circumstances' doctrine and the EFD.

The cases have been analysed not as the source of authority but as the examples of how a doctrine could become convincing for the new perspective. General conclusions are follows.

- 1) US cases have paid more attention to consumer demand, and the long-term consumer interests. EU case law has paid attention to both on consumer demand and the balance of the interests of the incumbent and the entrant (see sections 6.2 and 6.3). Both jurisdictions have now seen the impacts of switching costs on consumer interests. Notwithstanding its shortcoming, the *IMS* judgement on 29 April 2004 has set a precedent on how switching costs could be analysed in an Article 82 EC case.
- 2) Both jurisdictions seem more eager to apply the EFD or the exceptional circumstances doctrine to the vertical integrated cases than the horizontal competition cases, although the impact on the consumers in both types is comparable. In the EU, the doctrine was easier to apply if the entrants did not compete with the incumbent in the downstream market (*Magill*). In the US, it was the opposite (*Intel*).
- 3) Applying the essentiality-justification mechanism, the EFD could successfully be applicable to horizontal competition, as we have analysed in the case *IMS*.

We can use the essentiality and justification mechanism to solve the inconsistencies among the cases involving refusal to license. The major issue of the EFD and the *Magill*'s exceptional circumstance doctrine is that it has merged two steps, 'essentiality' and 'justification', into one procedure. These steps should be separated. Had procedural rules allowed the incumbent enough space to justify its refusal to license, and make different treatment between innovative and non-innovative markets, these doctrines could have been applied to intellectual property cases in a more balanced manner. Regrettably, the ECJ in *IMS Health* has missed the chance to set precedent in these issues (non-innovative markets and the balance between the parties' burdens of proof). It is hoped that the ECJ will consider these issues in *Microsoft Europe* when the case reaches the Court. My argument is that what is essential will depend on the characteristic of the market, the consumer demand (ΔU) and switching costs (S). The link

among these three factors should be the essentiality-justification mechanism, based on a fair share of burden of proof.

CHAPTER VII: RETHINKING THE THREE-STEP TEST

Would the revised EFD be consistent with the principles set forth in TRIPs, particularly Article 13 (the three-step test, see section 1.1.1.c)? This issue is significant in that it may reject or support the proposals in Chapter 6. My argument is that under current interpretation, no exception to copyright can prevent abusive exploitations and at the same time be consistent with the three-step test. This is even more so given the challenge of the information society (Senftleben, 2004).

However, to find a solution to this gridlock is not to define whether copyright law should prevail over competition law or vice versa, but to harmonize the inconsistency. I propose two options. The first option is to replace the words 'a normal exploitation' in Art. 13 TRIPs with 'the normal exploitation' or to interpret 'normal exploitation' as 'non-abusive exploitation' (Karnell, 1995). The second option is to replace the three-step test with the US fair use doctrine. These issues will be discussed in sections 7.3 and 7.4. Obviously, the fair use doctrine, as a national rule, cannot sit on the same plane with the three-step test, an international norm. However, taking rationality alone, this doctrine is more capable of providing a balanced solution and to control antitrust exceptions to copyright than the three-step test.

7.1 EXCEPTION TO COPYRIGHT AND THE ESSENTIAL FACILITIES DOCTRINE

The outcome of the EFD application, a compulsory license against access fee, is an exception to copyright (see OECD, 2001a: 189). If the EFD is by nature an exception to property rights, and Article 13 TRIPs (the three-step test) is the super control norm for all copyright exceptions, then it is obvious that any EFD case involving copyright should be subject to the three-step test. However, Ricketson (1999: 83) denies this link. He reminds that competition law falls beyond the scope of the three-step test, as stated in Article 40(2) TRIPs.

Under this provision, nothing in the TRIPs prevents its members from specifying the “conditions that may in particular cases constitute an abuse of intellectual property rights having an adverse effect on competition in the relevant market.” Gervais (1998), Katzenberger and Kur (1996) disagreed with Ricketson’s argument. If there is no link between competition law and the three-step test, then member countries can paralyse the effort to enhance copyright protection under TRIPs by reducing the scope of copyright protection or extending the scope of exceptions in the name of competition law.

I would support the arguments of Katzenberger, Kur and Gervais. Ricketson’s position has three shortcomings. The first shortcoming is that in Article 40(2) TRIPs there is an important qualification: any antitrust measures must be adopted ‘consistently with the other provisions’ of TRIPs. The ‘other provisions’ include Article 13 TRIPs. Hence, antitrust measures, including the EFD, should be rejected as far as it is not consistent with the three-step test.

In *Magill* (see section 1.1.2), the broadcasters had claimed that a compulsory license to Magill would violate the three-step test, since it has ‘conflicted with a normal exploitation’ of the television program, and the license to Magill has ‘prejudiced legitimate interests’ of RTE and ITV. In *United States v Microsoft Corp.* [1989] 165 F.3d 952, Microsoft has also used the same argument against Judge Jackson’s order to share its interface information with competitors. Even though both the European Court of Justice (ECJ) in *Magill* and the D.C. District Court in *Microsoft* have rejected these arguments, their reasons are not very convincing. These arguments simply turn down the defendant’s argument on a procedural basis.²⁶² Substantively, judge Jackson has not reconciled the conflict between antitrust measures and the three-step test. As for *Magill*, at para. 91 the ECJ simply held that the three-step test cannot preclude competition sanction if the latter “is the only way bringing the infringement [of Article 82 EC] to an end.” After *Magill*, AG Tesouro has commented that WTO Agreements (including Article 13 TRIPs) were capable of direct application to the cases before the ECJ (see

²⁶² The ECJ adjudicated that three-step test did not have direct effect on EC law (paras. 81-85, following the principle of supremacy of EC law over national law, see also *Portugal v EC Council* [1999] ECR I-8395). In the US, Judge Jackson held that it was not the job of a District Court to apply an international rule, which was only binding to the government.

the final pleading of AG Tesouro in Case No. 53/96; 13 Nov. 1997, § 22-37 and Dormer, 2000: 31). Most recently, when the European Commission ruled against Microsoft's refusal to license necessary APIs to competitors in *Microsoft Europe* (section 4.2.2.b), US trade representative Robert Zoellick has sought assurance from the EU trade commissioner Pascal Lamy that any ruling against Microsoft would not violate its intellectual property rights protected under TRIPs. Otherwise, the US can bring the case before the WTO Panel.²⁶³ All of these developments show that the three-step-test has an impact on competition law.

The second shortcoming in Ricketson's argument is that it has taken the provisions out of the context. Article 40.2 is part of Section 8, whose title is "control of anti-competitive practices in contractual licenses" (emphasis added). According to Katzenberger and Kur (1996), the title of Section 8 clearly indicates that the "conditions" referred to in Article 40 TRIPs are "only limited to conditions in contractual licenses and not other abusive behaviours." Citing Article 40 TRIPs is therefore an inappropriate defence for the EFD against the three-step test. The EFD does not govern 'contractual' license issues, only 'compulsory' license matters.

The third shortcoming of Rickteston's argument is in the deduction from Article 40 TRIPs that antitrust law and copyright law do not overlap. To this argument, Katzenberger (1996b) argues that there is no provision saying that TRIPs does not govern antitrust matters.²⁶⁴ On the contrary, most antitrust law textbooks reserve at least a chapter to discuss the boundary between competition law and intellectual property law.²⁶⁵ Even in the field of EC competition law,

²⁶³ Dombey, D. and Buck, T. "US sought assurances on Microsoft ruling" *Financial Times* 26 Mar. 2004: 25. See also Kanter, J. "Microsoft prepares counterattack" 22 *WSJ Europe* 40: A4. Microsoft has requested the CFI to suspend the Commission's ruling because it would cause irreparable harm to Microsoft's innovative effort. It has also raised the issue with the US government to bring the case at the WTO.

²⁶⁴ Regarding the possible abuse of software and how the three-step test deals with it, the *Report of the Committee of Experts on a Possible Protocol to the Berne Convention*, Fourth Session (1996) notes: "computer programs should be declared to be literary works ... but there should be no detailed provision relating to limitations or restrictions on the exclusive rights ... other than those already in the Berne Convention." (Para. 36).

²⁶⁵ Goyder (2003: 301-320), Whish (2001: 657-720), Heinemann (in Zach 2000: 240-285 and 301-321), and OECD (2001a).

which gains supremacy over national laws, Anderman (2002) and Goyder (2003: 308) also submit that any compulsory licensing, including EFD, must fulfil the conditions in Article 6 of the Software Directive (see section 2.2.2.a), which imply the three-step test. It is sufficient to quote Article 8(2) TRIPs and its intention to cover competition law issue: “appropriate measures, *provided that they are consistent with the provisions of this Agreement*, may be needed to prevent abuse of intellectual property rights ... or the resort to practices which unreasonably restrain competition” (emphasis added).

Correa and Yusuf (1998: 13) attempt to minimise the impact of the three-step test on antitrust measures by re-interpreting the word ‘consistent’ in Article 8(2) to mean “consistent with the preamble, objectives and principles of the TRIPs Agreement, not necessarily consistent with any particular provision.”²⁶⁶ Similarly, Heinemann (1996) interprets Articles 8 and 13 TRIPs to mean that the TRIPs members can restrict the rights of those who have abused a dominant position, so that the purpose of intellectual property will not be defeated. However, their interpretation has omitted the intention of the TRIPs drafters and the language of Article 8(2) itself, under which an international treaty should be interpreted (see Article 70.8 and 9 TRIPs). Article 31 of the *Vienna Convention on the Law of Treaties* (*Vienna Convention*, dated 23 May 1969) states that the interpretation of an international treaty should be based on the following priority: (1) the ordinary meaning, (2) the context, (3) the prior and the subsequent agreements, and (4) the intention of the parties. That is, the ordinary meaning should be in first priority.²⁶⁷ Since Article 8(2) TRIPs clearly mentions ‘consistent with the provision,’

²⁶⁶ Correa and Yusuf argued that it does not matter if certain measures may be inconsistent with some specific TRIPs standards, as long as “their overall consistency with TRIPs” has been taken into account. This is because the preamble of TRIPs stated that its objective is to reduce “distortions and impediment to international trade”, similar to the objective of antitrust measures: to sanction behaviours that affect trade (see Article 82(1) EC).

²⁶⁷ Article 32 of the same Convention also stated that the context can be used only if it does not ‘leads to a result which is manifestly absurd or unreasonable’ to the ‘international characteristics’ and ‘uniform application’ of the treaty.

interpreting otherwise would risk the uniform application of TRIPs.²⁶⁸ Gervais (1998) also remarks that the intention of the TRIPs drafters is to build the supremacy of Articles 8(2) and 13 over antitrust regulation.²⁶⁹

In short, antitrust measures must be subject to a super-control norm under copyright law. This conclusion is neither unfair nor unfortunate. It is a check-and-balance mechanism and a 'brake' to prevent the EFD from going too far. The issue is not whether the EFD or any antitrust measure *must* be consistent with the three-step test, but whether the three-step test *can* be an appropriate norm to control any antitrust measure. The argument in the next section is that neither the EFD nor any antitrust measure can comply with the three-step test.

7.2 INCONSISTENCY BETWEEN THE THREE-STEP TEST AND ANTITRUST MEASURES

The idea of using the three-step test as a 'super control norm' is not the original intention of the TRIPs negotiators. In the first draft, Document W/76, Article 13 TRIPs was not written with "a normal exploitation of the work," but with a request that any exception to copyright "do not impair a ... market for or the value of the protected work."²⁷⁰ However, this proposal was criticised by copyright associations and ultimately replaced by a language similar to Article 9(2) *Berne*. This provision originally was not a super-control norm for all copyright exceptions, but only for the exceptions to reproduction rights (see e.g., Drahos, 1995: 15; Gervais, 1998: 2.69).

²⁶⁸ Under Article 31(1) *Vienna Convention*, the interpretation of Article 8(2) must be in good faith, but as McNair (1961: 21) formulates, good faith does not mean establishing an alternative interpretation while the text of the treaty is clear. Moreover, the preambles as Correa and Yusuf cited are general principles, and Article 13 TRIPs (the three-step test) is a specific rule. According to the principle *lex specialis derogat legi generali*, provisions of Article 13 should prevail over TRIPs preambles on interpreting Article 8(2).

²⁶⁹ Gervais (1998: 2.49) notes: "it would be difficult to justify an exception not foreseen under the [TRIPs] Agreement, unless it is an exception to a right not protected under other provisions of the TRIPs Agreement or those of other international instruments incorporated in TRIPs."

²⁷⁰ Draft of July 23, 1990, Doc. MTN/GNG/NG11/W/76: "Parties shall confine any limitations or exemptions to exclusive rights (including any limitations or exceptions that restrict such rights to 'public' activity) to clearly and carefully defined special cases which do not impair an actual or a potential market for or the value of the protected work."

When Article 9(2) *Berne* is adopted words-by-words to Article 13 TRIPs, it is unable to carry out the enormous task of a super-control norm for all exceptions to copyright. To use the best effort to interpret the three-step test in the manner that it could cover antitrust exceptions, we therefore need to look for other sources that give effects on the three-step test. The first source is the conclusion of the WTO Panel in the *United States* case (WT/160/R1), which interprets Article 13 TRIPs. The second source is the preparatory works, reported in the *Records of the Intellectual property Conference of Stockholm*, 11 June to 14 July 1967 (“*Stockholm Records*”), where the three-step test has originally come from.²⁷¹

7.2.1 INTERPRETATION OF THE THREE-STEP TEST

When the three-step test was firstly adopted under Article 9(2) *Berne*, its design is similar to a pyramid. Any proposal of exception to copyright must pass the ‘certain special cases’ test, then the ‘normal exploitation’ test will be analysed. The ‘unreasonable prejudice’ test will be the last test before the exception is deemed to comply with TRIPs. Thus, the scope of “special cases” is broader than the cases that “do not conflict with a normal exploitation of the work.” The scope of the uses that “do not conflict ...” is broader than that which “do not cause unreasonable prejudice to the legitimate interests of the rightholders.” Otherwise, we need only a one-step test or a two-step test.²⁷² Nevertheless, Doherty and Griffith (1995: 22) have found a paradox in the pyramid structure: “if a use does not conflict with a normal exploitation of a work, how could it prejudice a legitimate interest of the rightholder?”

²⁷¹ Under Article 31 of the *Vienna Convention*, if the ordinary meaning of the three-step test is vague, we need to refer to the context and the preparatory works leading to it or subsequent judgements (either Article 13 TRIPs or 9(2) *Berne*).

²⁷² The pyramid structure was described in the *Stockholm Records*, as reproduced in the *Berne Convention Centenary*: 197 (see Ricketson, 1986: 482): “if it is considered that reproduction conflicts with the normal exploitation of the work, reproduction is not permitted at all. If it is considered that reproduction does not conflict with the normal exploitation of the work, the next step would be to consider whether it does not unreasonably prejudice the legitimate interests of the author.”

In the history of three-step-test adoption, there has never been any clarification to this point. To find the appropriate meaning of Article 9(2) *Berne*, one can trace back to the draft of Study Group in 1963 for revision of the *Berne Convention*.²⁷³ The drafters have used the words “not enter into economic competition” instead of “not conflict with a normal exploitation.”²⁷⁴ Masouye (1962) explains that the former words to mean only trivial/*de minimis* unauthorised uses. The 1965 the Committee of Governmental Experts (*Stockholm Records*: 113) amended the language of the proposed Art. 9(2) and add the words “not conflict with a normal exploitation of the works.” The intention behind this sentence remains ambiguous.²⁷⁵ This draft has been submitted to the Main Committee I for debate at the Stockholm Conference, and although there were extensive discussions, the words ‘normal exploitation’ were not challenged. Neither there were any discussion of the potential conflict between copyright and competition law.²⁷⁶ Under Article 9(2) *Berne* (reproduction), exception to the reproduction right means slavish copying, and only *de minimis* slavish copy does not conflict with a normal exploitation of the work.²⁷⁷ That being said, normal exploitation rather relates to the economic benefit of the

²⁷³ The Group was established under the supervision of Swedish Government and the International Bureaux for protection of Intellectual Property (“BIRPI”, today WTO). See *Stockholm Records* Vol. 1: 111.

²⁷⁴ As Ricketson (1986: 480) noted, the original proposal of the Study Group to the current Article 9(2) *Berne* was: “[members may] limit the recognition and the exercise of [copyright] for special purposes, and on the condition that these purposes should not enter into economic competition with these works.”

²⁷⁵ In February 2002, I have been introduced by Professor Sterling to Professor Gunnar Karnell of University of Stockholm, who would most likely to have access to manuscripts of the Committee of the Governmental Experts and the Study Group of the Stockholm Conference. Unfortunately, Professor Karnell informed that the manuscript have been disposed.

²⁷⁶ *Stockholm Records*: Doc S/75 - S/81 and Ricketson (1986: 481).

²⁷⁷ “If ... any reproduction conflicts with the normal exploitation of the work, reproduction is not permitted at all... If it consists of producing a very large number of copies, it may not be permitted ... If a small number of copies is made, photocopying may be permitted without payment, particularly for individual or scientific use.” (*Stockholm Records*: 1146, Document S/1: 43-49, Vol.1: 615,622, 630). For supports of the *de minimis* approach in UK fair dealing, see Brinelow (2001).

rightholder (large number v. small number of copies) than the behaviour of the user as such (copy).²⁷⁸

However, if ‘not conflict with normal exploitation’ means *de minimis* reproduction, such an interpretation is difficult to apply to the digital environment. Thanks to the Internet, a single unauthorised copy could spread out instantly to a large number of copies (see Senfleben, 2004). There is no *de minimis* reproduction in the digital environment, and the user cannot guarantee it.²⁷⁹ Secondly, if a reproduction would be conflict with a ‘normal exploitation,’ then unauthorised copy of software cannot be exempted, even for the purpose of interoperability. Hence, it is doubtful whether the guideline of the Study Group or the Main Committee I on ‘normal exploitation’ could be helpful taken out of its original context - reproduction rights to books and periodicals. It is even more doubtful if the ‘normal exploitation’ condition, with its abstract meaning, could become a feasible test for all exceptions to copyright, let alone antitrust measures. One may argue that the words ‘certain special cases’ in the three-step test allow national law to enumerate antitrust measures as special case. However, the fulfilment of first test does not mean the fulfilment of the ‘normal exploitation’ test. Between the first and the second tests there is a word ‘which’ (see section 1.1.1.c).

In an attempt to provide a balanced protection, Article 5 of the Information Society Directive (2001/29/EC) provides certain exceptions to copyright in the digital age. However, Articles 5.5 and 11 (which amend Directive 92/100/EC) reinstate that all exceptions must be subject to the three-step test, without explaining what these tests really mean. This reservation makes the exceptions become unpredictable (see also Hart, 2000).

²⁷⁸ Prior to the Committee I, the Study Group also emphasised: “[Countries may provide exception to copyright for special purposes] on the condition that ... all forms of exploiting a work, which have, or are likely to acquire, considerable economic or practical importance, must be reserved to the authors. See Document S/1: Proposals for Revising the Substantive Copyright Provisions (Articles 1-20): 42, and WT/DS160/R: 7.179.

²⁷⁹ Geller (1990: 27 and 30) also argues that the three-step test was adopted in a metaphysical approach, which obviously lead to absurd interpretation.

The WTO Panel in the *United States* case (2001) WT/DS160/R has attempted to solve the ambiguous meaning of ‘normal exploitation’ in the digital environment. The Panel have noted that an exception to copyright would obviously result in actual (short-term) negative effects on the rightholder, and what should be the concern was the long-term (potential) effect on the exception.²⁸⁰ At para. 7.187, the Panel reminded that as copy technology develops, some uses that did not have actual impact on the rightholder might potentially become so, and “what is a normal exploitation in the market-place may evolve as a result of technological developments.” As any digital copy would be contrary to a normal exploitation of the work, hardly any antitrust measure conforms with the three-step test.

Similar to the WTO Panel’s interpretation, the official notes of Article 10 of the WIPO Copyright Treaty (WCT) states that the three-step test permits contracting countries to impose new limitations in respect to digital works, provided that they are “appropriate with the new environment.” However, this cannot be understood as an opportunity to enlarge the scope exceptions to be appropriate with the digital environment. According to Reinbothe and Lewinski (2001: Art. 10), the meaning of the official note is that even in the digital environment, the three-step test must be strictly adhered to. The scale swings even more to the rightholder’s side.

To conclude, neither Article 9(2) *Berne* nor Article 13 TRIPs are capable of covering antitrust measures. There is also no anticipated link between Article 9(2) *Berne*, Article 13 TRIPs and the concern of copyright abuse in mind the delegations at the Stockholm Conference in 1967 or the WTO Panel in 2001 at the *United States* case. For the three-step test to be able to control antitrust measures, as the TRIPs drafters intend, the condition “not conflict with a normal exploitation ...” should be amended.

²⁸⁰ WT/DS160/R: 7.186-214: “we need to take into account those whose use ... is free as a result of the exemptions, and also those who may start using ... once its use becomes free of charge.” See section 7.3.1 below for the facts of the case.

7.2.2 AMENDMENT/RE-INTERPRETATION TO THE 'NORMAL EXPLOITATION' CONDITION

My argument is that the words 'a normal exploitation' in the second condition of the three-step test should either be replaced by 'the normal exploitation' or be reinterpreted differently from the official interpretations set forth in section 7.2.1. If the replace 'a' with 'the', the right to gain benefit from the normal exploitation will be protected, not the right to refuse to license. Copyright gives the rightholder a chance to recover benefit from its innovative effort, not an absolute right to exploit monopoly rent (see section 3.1.1). When an exploitative act moves from the stage of 'normal' to become 'abusive' because of the conditions set forth in section 3.4, copyright should not protect it. What is '*the normal*' will depends on the context of the market.²⁸¹ If the word 'a' cannot be replaced by 'the', then at least we should adopt the interpretation of Karnell (1995: 213). He has taken the position that the condition 'not conflict with normal exploitation' should be applicable only when the rightholder has not abused his rights (hereinafter "Karnell's interpretation").

The above proposal would also conform with the embedded objectives of the WCT, as stated in its Preamble, is to "provide adequate solutions to the ... new economic, social, cultural and technological developments, the convergence of information and communication technologies" and "maintain a balance between the rights of authors and the larger public interest, particularly ... access to information."

Interestingly, the Basic Proposal to the WCT had used the term 'the normal' instead of 'a normal,' but the delegation of the United States has rejected this proposal. To comment, Reinbothe and Von Lewinski have interpreted that while imposing any copyright exception,

²⁸¹ Gervais (1998: 2.72) also asserted that the term "exploitation" implies an evaluation of the relevant market for exploiting the rights, which depend on the category of work. If the market for schoolbooks is the education market, limiting the author's exclusive right to reproduction albeit for educational purpose could certainly interfere with the author's "normal exploitation."

national law must analyse *each* right, not the exploitation rights as a whole.²⁸² When the word ‘a’ is replaced by ‘the’, such a restriction would not apply, and the normal exploitations should be those *in normal circumstances* (i.e., without abuse) could acquire “considerable economic or practical importance to the rightholders” (conclusion of the WTO Panel in *United States* case, section 7.181). When this amendment can be implemented, the normal exploitation of the work needs not be the right of refusal to license. It can be the right to charge a royalty for access the work, either through voluntary or compulsory licenses.

7.3 FAIR USE AS AN ALTERNATIVE SOLUTION

7.3.1 FAIR USE IN COMPARISON WITH THE THREE-STEP TEST

As argued so far, the current three-step test as it stands cannot become a super control norm unless the word ‘a normal exploitation’ is amended to become ‘the normal exploitation’. The next question is whether there is a better ‘super control norm’ on copyright exception than the three-step test, namely the US fair use doctrine (see section 1.1.1.c). This doctrine allows an exception to copyright after balancing the costs and the benefits of such grant, taking into account (1) the purpose and the character of the use, (2) the nature of the work, (3) the amount of the use, and (4) the effect of the use (17 USC § 107, see section 1.1.1.c).

Some commentators may argue that there is no significant difference between the fair use doctrine and the three-step test. That is not the case. The fair use doctrine was originated from 1939 in *Dellar v Samuel Goldwyn* 104 F.2d 661 (2d Cir.) or even from 1740 under *Gyles v Wilcox* (see Burrell, 2001: 366), long before the three-step test was formulated in the 1967 Revision of the Berne Convention.²⁸³ The US was not a member of the *Berne* then, and

²⁸² Reinboth and Lewinski (2001: 125): “for example, national law should not argue while taking away the exclusive reproduction right of the author that he should seek other ways of remuneration from his other rights (adaptation, performance) to compensate his loss.”

²⁸³ Laddie *et al.* (2000: 20.4) note that the first case on fair dealing in UK, which inspires the adoption of the fair use doctrine in US, is *Stockdale v Omwhyln* [1826] 5 BC 173.

therefore the fair use doctrine has not influenced the drafters of Article 9(2) *Berne*, and *vice versa*. No US judgment has ever taken into account the three-step test. Technically speaking, they need not to. Article 13 TRIPs starts with ‘member countries shall confine...’, which means that the compliance with three-step test is an obligation of a national legislation, not a court or a public authority.²⁸⁴

When comparing the three-step test with the fair use’s four factors, there is a similarity between first factor (the purpose of the use) and the first test (the ‘certain’ special cases). There is some link between the fourth factor (the effect of the use) and the third test (without unreasonable prejudice to the legitimate interests of the rightholders). However, the remaining factors are not comparable with the second condition of the three-step test (do not conflict with a normal exploitation of the work). This gives rise to a major source of conflict between the fair use doctrine and the three-step test.

This conflict emerged in 2000 when the European Union lodged a complaint against the United States at the WTO Dispute Settlement Body (DSB) for violation of the three-step test (*European Union v United States* [2001] WT/DS 160/R). The subject matter of the dispute is section 110(5) of the US Copyright Act, which exempts from copyright liability anyone who merely turns on, in a public place, an ordinary radio or television for others.²⁸⁵ Notwithstanding the argument from the United States that section 110(5) complies with the fair use doctrine, the DSB has concluded that it did not adhere to the three-step test, particularly the ‘normal exploitation’ test (WT/DS 160/R, at para. 6.214, see Decker (2001)).

²⁸⁴ Gervais (1998: 1.03) noted that WTO Agreements only apply to governments, not citizens. For the similar effect on the European Union, see the ECJ Opinion 1/94 on the effects of WTO Agreements on European citizens. That means a private party cannot refer to the TRIPs three-step test before a national court.

²⁸⁵ WT/DS160/R: 2.5. The EU brought a lawsuit against the US that under 17 USC §110(5), US small restaurants do not have to pay license fees for receiving all music, including European composers, which is the case in Europe. In *Twentieth Century Music Corp. v Aiken* [1975] 422 US 151, the Supreme Court held that radio reception in a small restaurant is not a performance under the copyright act.

7.3.2 COST-BENEFIT ANALYSIS AS THE CORE OF THE FAIR USE DOCTRINE

Seltzer (1977: 15), Landes and Posner (1989: 361-363), among other commentators, explain the logic of fair use purely on economic bargaining and the costs and benefits of copyright enforcement. As “the copyright owner is not the trustee of the users,”²⁸⁶ it is arguable that fair use is available only for *de minimis* unauthorised use, where such a use is not worth enforcing. As this argument goes, when technical measures or contract can prevent piracy, fair use or perhaps copyright should no longer exist. In *Sony* [1984] 464 US 417, the Supreme Court has rejected these arguments:

“The fair use doctrine must strike a balance between the dual risks: ... that depriving authors of their monopoly will reduce their incentive to create, and ... that granting authors a complete monopoly will reduce the creative capacity of others.”

By using the word ‘balance,’ the Supreme Court’s intention is to base fair use on a cost-benefit analysis rather than *a priori* speculation. However, not the private costs and private benefits of the enforcement as Landes and Posner argued, but the social costs and benefits of the unauthorised use shall be taken into consideration. A use is ‘fair’ if the court is convinced that the benefits of the use are larger than the costs to society.²⁸⁷ Balancing costs and benefits is also the reason behind the essentiality-justification mechanism (see sections 5.5.2 and 6.1), thus there is a ‘common language’ in the discourse between the fair use doctrine and competition law.

As the fair use doctrine is based on cost-benefit analysis, it can be a super control norm for antitrust exceptions to copyright. This is because an antitrust measure against abuse of a dominant position are also rendered when the social benefits from it are larger than the social costs suffered by the monopoly (see Coase, 1960: 14, and sections 1.1.2.b, 3.1.1 and 5.5.3

²⁸⁶ See the judgment of the US Supreme Court in *Fox Film Corp. v Doyal*, (1932) 286 US 127.

²⁸⁷ Samuelson (2000b) and Derclaye (2003) also postulate that public interest is the surplus of benefits over costs to society.

above). On the other hand, cost-benefit analysis is a feature that does not exist in the three-step test. That is why this test cannot be compromised when the context it applies upon is changed. Below we can see that how pro-competitive the fair use doctrine could be, as opposed to the three-step test, thanks to its economic implications.

7.3.3 STRIKING A BALANCE AMONG THE FOUR FACTORS OF THE FAIR USE DOCTRINE

a. *The purpose of the use*

As Judge Kozinski in *Sony* (*id.*, at 450) emphasised, the public interest in the use (its purpose) is the most important factor of the fair use doctrine. To assess whether the purpose of the use is fair, Judge Leval in *Texaco* has summarised the following relevant factors from *Sony* [1984] 464 US 417, *Lewis Galoob v Nintendo* [1992] 964 F.2d 965, *American Geophysical Union v Texaco* [1994] 37 F.3d 881, *Williams & Wilkins Co. v US* [1973] 487 F.2d 1345 and *Atari v Nintendo* [1992] 975 F.2d 832:

- 1) Whether the use is non-commercial or commercial use. A commercial use is presumptively unfair; but it needs to be considered in conjunction with other factors to be conclusive.²⁸⁸
- 2) Whether the use is unavoidable in the situation (i.e., there is no feasible substitute). In *Sega v Accolade*, *Atari v Nintendo*, and *Sony v Connectix*, the Ninth and the Federal Circuit held that the decisive factor in allowing fair use for reverse engineering is whether it is possible to access the necessary functional elements without such practice.²⁸⁹ In

²⁸⁸ *Harper & Row*, 471 US at 550, *Basic Book v Kinkos's Graphic Groups*, 758 F. Supp at 1530. In *Harper & Row*, *id* at 562 the Court said: "the crux of the profit/non-profit distinction is ... whether the user stands to profit from exploitation of the copyrighted material without paying the customary price." However see *Texaco*, at 93: "a commercial use ... is not, *ipso facto*, disqualified from fair use protection. The court ... must consider and weigh all particular use is or is not a fair use."

²⁸⁹ *Sega*, 977 F.2d at 1514, 1518; *Atari*, 975 F.2d at 843-44. *Connectix* 203 F.3d 956.

these cases, the courts held for the fair use defence regardless of the fact that reverse engineering is used for commercial purposes.

- 3) Whether the use is non-transformative, non-productive or superseding. If the copy duplicates and supersedes the original without any value added, generally fair use is precluded. ‘Value added’ does not mean ‘innovation’, but consumer utility surplus.

If the user passes the first test but fails the last two tests, such an unauthorised use could be fair only if the harm to the rightholder is minimal.²⁹⁰ If the user fails the first test but passes the last two tests, his use would more likely to be ‘fair’.²⁹¹ In *Sony*, *Fortnightly* and *Teleprompt*, the minority of the Supreme Court has questioned whether the use is purely non-commercial or non-transformative.²⁹² However, even a commercial use could still be a fair use if there is no viable alternative to satisfy a consumer demand for new technologies. This has been the case of cable television in *Fortnightly*, videocassette recorders in *Sony* and game cartridge in *Atari*. As Hamilton (2000) summarises, the judicial history of the Supreme Court has placed more emphasis on the substitutability and productive test over the non-commercial test. Samuelson (1994: 21-27) also remarks that the substitutability test can be contrary to conventional thinking that the non-commercial test is decisive, but what the court did was to analyse the costs and the benefits of implementing the fair use defence is a particular situation.

²⁹⁰ See *Williams & Wilkins*, 487 F.2d at 1349, the survey showed that only 12% of the copies may prejudice the interests of the copyright holders. In *Sony*, 464 US 417, surveys from both sides have shown that the harm for copyright holders is minimal and the primary use of VCR is for time-shifting purpose.

²⁹¹ *Sega* and *Nintendo* (see hyphen (2) above). In *Galoob*, 964 F.2d 965, the Ninth Circuit ignored Galoob’s obvious commercial purpose in marketing its allegedly infringed product (Game Genie). Although the Circuit did refer to the non-commercial use in *Sony* (that Nintendo’s game was altered primarily by the kids at home, for non-commercial purpose), the reason behind was to support consumer demand in downstream “derivative works.” Galoob passes both substitutability and transformative/productive test, as its game is innovative and the copied part is necessary. See also Samuelson, P. (1994: 22).

²⁹² 464 US 417 (1984), 392 US 390, 400-1. (1968), 415 US 394 (1974). See particularly the dissent of Justice Blackmun in *Sony* case. Note that *Fortnightly* and *Teleprompt* were not fair use cases since they were rendered before 1976, the year the fair use doctrine was enacted in Title 17 USC § 107.

If the user fails the substitutability test, meaning that the use is evitable, there is no fair use regardless of the result of the first and the third test. In *Texaco*, the defendant has argued that photocopying a scientific article for research purpose was transformative and productive. However, it has failed the substitutability test.²⁹³ *Sony*, *Texaco*, *Galoob*, *Sega* and *Atari* also show that passing the substitutability test is crucial (except for *de minimis* use). The priority of the 'substitutability' test over the commercial use test highlights that cost-benefit analysis is truly the motivation behind fair use doctrine. The issue is not whether the use is *de minimis*, or whether it is non-commercial.

The priority of the substitutability test over the commercial/non-commercial test in the end brings benefit not only to the users but also to the rightholders (see e.g., Hamilton, 2000). The support of a new technology in *Fortnightly* and *Teleprompt* is one of the reasons that had helped cable television to develop more in the US than in Europe. Similarly, the *Sony* judgment has played a significant role to promote the VCR industry (Bettig, 1996: 179; CED, 2004: 14).

When we apply the above tests to the essentiality-justification mechanism, the last two tests (substitutability and transformative) are consistent with the requirement of essentiality and consumer benefit in the essentiality-justification mechanism. If the user can prove that an element of the work is an infrastructural element and using it is inevitable to bring about consumer benefit, even a commercial use can be a fair use. What the court is concerned is whether the benefits of the use are larger than the probable risks of sunk costs and free riding.

b. The nature of the work being copied

Regarding the nature of the work, the court has analysed three factors: (1) whether the copied work is truly creative, which requires strong protection, (2) whether the copy is a primary or a derivative work, and (3) whether access to the work is freely available (subject to

²⁹³ Free copying has been neither unavoidable nor reasonable and customary, as there was a commercial practice to pay a royalty through the Copyright Clearance Center (CCC). *Texaco*, Corporate Disclosure Statement: 45-56. For critiques of this judgment, see Casarez (1996: 641).

the payment).²⁹⁴ Applying these three tests to the EFD, if an essential facility is a product of compatibility requirement rather than creativity, such as interfaces and data formats, the chance to rule that its copy is a fair use is higher. That has also been the case of *Sony v Connectix* or *Computer Associates v Altai* (see section 2.2.2). Moreover, the fact that interfaces and data formats are derivative rather than primary works also favour the fair use consideration.²⁹⁵

c. The substance of the use

With respect to the substance of the use, the court will consider whether the whole work or only part of it is copied. Unlike the three-step test, which only allows *de minimis* copy, the limit of fair use is the necessity rather than the extent of the use. In *Sony* (464 US 417: 431), the Supreme Court ruled that even copying the whole film is a fair use if it is necessary and justified for the purpose, and ‘the usual presumption that wholesale copying precludes fair use would not hold’. In *Atari* (975 F.2d at 843) however, the Federal Circuit held that what Atari copied from Nintendo was more than necessary and was not proportional to the justified need. The EFD could comfortably fit with this principle: as long as the copy of a *de facto* standardised work is inevitable, the third test of the fair use doctrine is satisfied.

²⁹⁴ These tests are summarised from *Texaco*, Corporate Disclosure Statement: 57. See *Galoob*, 780 F. Supp at 1293 (for derivative work). The Supreme Court in *Harper & Row*, 471 US at 563 held that an authorised quotation from the heart of an unpublished manuscript, which was intended to trump author’s first publication, did not constitute fair use. At the same time, the Second Circuit in *Era v Carol* 904 F.2d at 157 held that the scope of fair use is greater in factual work than in non-factual work. In *Feist* [1991] 510 US 571, the Supreme Court rejected the sweat of the brow doctrine as inconsistent with the copyright act.

²⁹⁵ See *Galoob*, 780 F. Supp at 1293, *Sega* 977 F.2d 1510, and *Atari* 975 F.2d 832 (interfaces are derivative work compared to an compatible computer program).

d. The effects of the use

The effect of the use is the second most important factor after the purpose of use.²⁹⁶ At this stage, the court requires the incumbent to justify that the use causes substantial harm to its actual or potential markets. Using cost-benefit analysis, the court can calculate and compare the effects of implementing copyright, as opposed to the effects of recognising the fair use defence. The fourth factor of the fair use doctrine is similar to the justification step in the essentiality-justification mechanism. However, this factor is but different from the condition ‘not causing unreasonable prejudice’ of the three-step test at three points.

- (1) The harm should be directly related to the market for the copyrighted products, not a related market. The Ninth Circuit remarked in *Atari v Nintendo*: “the rightholder has a property interest in preventing others from reaping the fruits of his labour, not in preventing ... making use of, or building upon, his advances (in another market).”²⁹⁷
- (2) The harm should be quantified by fact, not by mere subjective impression.²⁹⁸
- (3) If the incumbent’s harm were much smaller than the consumers’ benefit, the court would rather let the incumbent mitigate its loss than preclude fair use, as Gordon (2001: 20)

²⁹⁶ See *Galoob*, 780 F. Supp. at 1295, citing *Stewart*, 495 US at 238. In a UK decision, *Pro Sieben Media v Carlton UK TV Ltd.* (1999) 1 WLR 605, Laddie J also noted that “the impact of the use to the audience, not the purpose, is the determinative factor in the fair dealing doctrine.” See the comment of this case in *EIPR* (2000: 290) and *EIPR* (1999: 21).

²⁹⁷ *Atari v Nintendo*, 975 F.2d. 832 (Fed. Cir. 1992). In *Galoob*, 780 F. Supp. at 1295, Nintendo argued that Galoob’s use causes harm to Nintendo in its cartridge market. The Court rejected this argument, ruling that Nintendo’s markets are console markets and game markets, such cartridge market did not exist.

²⁹⁸ In *Sony*, Justice Ferguson rejected the proof of “patterns” and “ratings” as a “black art ... because of the significant imprecision involved in the calculation.” (*Id.*: 469). However, Justice Blackmun dissented, as for him the damages are self-evident and requires no proof.

argues.²⁹⁹ In *Sony*, the Supreme Court has been aware that VCR could be used for illegal purpose, but this will not create a collective action.³⁰⁰ Thus, in assessment of the effects of the use, the Court does not pick some specific infringers, but it looks at the market as a whole and estimate whether the free riding attitude will become a collective action as a result of its judgements.

Another difference between the three-step test and the fair use doctrine is that the earlier does not encourage the rightholder to mitigate when his loss is smaller than the public benefit. By doing so, the rightholder may become less responsible to society and even to his interests. As we have suggested in Chapter 5, the rightholder under the fair use doctrine, as the incumbent under the EFD, should explore other methods to recover sunk costs and minimise free riding (monetary incentives) before recourse to refusal to license (the time incentive).

RECOMMENDATIONS AND CONCLUSION

This chapter has criticised the ‘not conflict with a normal exploitation of the work’ of the three-step test, which allows only *de minimis* reproduction to be exempted from copyright protection. This condition is not suitable to the digital environment. Nevertheless, it is still necessary to have a super control norm over exceptions to copyright, in order to prevent the abuses from the entrant’s side. Given the shortcoming of the current three-step test, this chapter has explored two possible solutions (1) replace the three-step test with the fair use doctrine, and

²⁹⁹ In *Sony, id.*: 456-457, the Court has decided that it is no need to prohibit the use when it did not affect the author’s incentive to create, and the prohibition of home taping does not bring any countervailing benefit.

³⁰⁰ 464 US 417: 455-456. Contrary to the Court of Appeal opinion that the user might copy the whole program, the Supreme Court stated that such a use did not have its ordinary effect of mitigating the finding of fair use.

(2) replace 'a normal' with 'the normal' in the three-step test or follow Karnell's interpretation.³⁰¹ The advantages and disadvantages of each option are analysed below.

a. Option One: replacing the three-step test with the fair use doctrine

The most obvious advantage of Option One is that the US is the origin country of the fair use doctrine. Therefore, they might not have a sound basis of objecting the adoption of the fair use doctrine in the future TRIPs revision. However, as Article 2 TRIPs already reminded, TRIPs are the minimum standard for intellectual property protection. It is doubtful that the future revision might lower such a standard; and the standard of protection under the fair use defence is lower than the three-step test.

Even if the fair use doctrine cannot be adopted at an international level, it can be enacted by national legislation. Singapore has adopted the US fair use doctrine to Section 35 of its Copyright Act 1985. Canada and Australia have also considered enacting an open-ended fair use doctrine following US law instead of the closed fair dealing provisions of UK law.³⁰² Samuelson (1998) suggests that developing countries should consider adopting exception to copyright akin to the fair use doctrine. As long as section 107 of the US Copyright Act is not questioned as to its compliance with TRIPs, the countries that follow the US example should not be questioned.

Two arguments may disfavour Option One. One should not consider the fair use doctrine before TRIPs becomes effective, as equivalent to the fair use doctrine after TRIPs (1994). All

³⁰¹ Technically speaking there is another option that is to replace the words 'provisions' in Article 8(2) TRIPs with 'objectives' and 'principles'; see Correa and Yusuf (1998) and Heinemann (1998). However, as noted in section 7.1.2, 'objectives and principles' are abstractive words and could hardly prevent antitrust measures from going too far. TRIPs would have run the risk of losing uniform application if national laws would apply Article 8(2) discreetly.

³⁰² Burrell (2001). However, the proposal for a fair use doctrine in Canada and Australia have not been accepted, since it was feared that the court could be given too broad competence in providing exception to copyright. For Singapore Law, see Choo-Ludwig (1988: 767).

the examples that I have analysed so far, except for the *Connectix* case, were rendered before 1995. Afterwards, the US Congress has passed many laws, strengthened the position of the rightholders and effectively narrowed the scope of fair use.³⁰³ The fair use doctrine now should be interpreted in light of the three-step test. That is, only *de minimis* reproduction would qualify for fair use. The WTO dispute over § 110(5) US Copyright Act is a good example of how fair use exemption could be re-interpreted in light of the three-step test (see section 7.3.1).

In addition, adopting a fair use doctrine would only be feasible for the common law countries, where the judgment from a higher court should be followed by the lower courts (*stare decisis*) and by doing so the uniform application of copyright is guaranteed. If the fair use doctrine were adopted in a civil law country, each court would have a considerable discretion to make decision regarding the purpose, the nature or the effect of the use. A legal transplant from the US to other countries is therefore not simple.

While the arguments disfavouring the fair use doctrine are sound, they have rather expressed a subjective view. Regarding the first challenge, we can see from *Connectix* and *Microsoft* that the way courts interpret the fair use doctrine after 1995 has not been changed. When Microsoft challenged Judge Jackson (2000) that his anti-trust ruling would be contrary to the spirit of the three-step test, the judge has answered that the three-step test has created no obligation to the court, although it might require the US to comply as a WTO member state.

To counter the argument that fair use is too ambiguous for a civil court to apply, please note that it is doubtful whether the three-step test would be less ambiguous than the fair use doctrine. Both doctrines have used contextual words and therefore need clarification. For example, Article 760 of the Vietnamese Civil Code and Article 22 of the new Chinese Copyright Act 2001 states that users may copy a work for the purpose of 'public' interests, provided that such

³⁰³ Coble, H. (2000). These acts are the *Digital Performance Right in Sound Recording Act* (1995), *Copyright Technical and Clarifying Amendments* (1997), *No Electronic Theft Act* (1997), *Digital Millennium Copyright Act* (1998), *Copyright Technical and Clarifying Amendment* (1999), *Digital Theft Deterrence and Copyright Damages Improvement Act* (1999), and the *Uniform Computer Information Transaction Act* (UCITA 2001).

a copy “does not conflict with the normal exploitation of a program and does not cause unreasonable prejudice to the legitimate interests of the rightholder.” This provision provides a leeway for unauthorised copy of computer programs, leaving the words ‘public’ interests, ‘normal exploitation’ and ‘unreasonable prejudice’ to free interpretation.³⁰⁴ On the contrary, fair use doctrine does not just contain empty factors. This doctrine has been elaborated by case law that provides methods to strike a balance between the costs and benefits of the use. If a civil law country adopts this doctrine with further guidelines similar to the summary of Judge Leval in *Texaco* (see section 7.3.3.a), its courts may apply the fair use doctrine properly.

The last problem is whether a proposal for adopting the fair use doctrine wins political support in developing countries. These countries might be suspicious toward adoption of a US law provision. Since the US have always claimed that developing countries lack adequate protection of US intellectual properties, one may have a wrong impression that US copyright law is the most conservative one. Therefore, lawyers from developing countries are supposed to explain to their governments how pro-user and pro-innovative the fair use doctrine is. When political support for adopting the fair use doctrine is gained, enacting this doctrine to national legislation or even pushing the doctrine to the TRIPs negotiation table is possible.

At the first step, I would recommend to introduce the fair use doctrine at the national level. It is much less obvious whether the fair use doctrine could be introduced to the TRIPs Agreement to replace the three-step test. This is because TRIPs Agreement is amended only by unanimous agreement, except for the changes that give more protection of the rightholder. Article 71 TRIPs stated that any amendment to TRIPs must be consented unanimously by the TRIPs Council, and only ‘in the light of any relevant new developments’.³⁰⁵ As the digital

³⁰⁴ For unauthorised copy of software program under Chinese law, see Juan and Pun (2000), Li (2001). Ironically, the IIPA criticised that this provision was “*imprecise*” and “*not compliant with Article 13 TRIPs*”, <<http://www.iipa.com>>, accessed 23 Apr. 2002.

³⁰⁵ There is an exception to the unanimous rule. These are amendments that merely require a higher standard of protection, to be adopted by 2/3 majority, which is not the case here. See WTO Agreement, Art. X.

environment has been with us for a few decades, it is not a new fact that justifies TRIPs amendment. Switching costs are also not a new fact, although they have been subtle so far.

b. Option Two: replacing “a” with “the”, or follow Karnell’s interpretation

The difficulties to apply the fair use doctrine at international level leads to Option Two: replacing the word ‘a normal exploitation’ with “the normal exploitation” or follow Karnell’s interpretation. Elsewhere I have presented arguments why this is necessary. “A normal exploitation”, in its plain meaning, is a highly unrealistic standard of copyright exception in the digital environment and cannot prevent abusive exploitation of copyright should it happen. Although it seems too late to change Article 13 TRIPs, for the reasons explained in the above paragraphs, we can re-interpret the ‘normal exploitation’ condition. The interpretations of Reinboth and Lewinski (1999), Katzenberger and Kur (1996), Ricketson (1999) and even the WTO Panel in the United States case are not binding. It is hopeful that when the next case involving the three-step test is brought before the WTO Dispute Settlement Body, the Panel will adopt Karnell’s interpretation.

CONCLUSION

A number of issues have been covered in seven chapters. Starting from the multi-layered structure of the software sector, this thesis has examined the borderline between copyright and competition law in the interfaces and data formats. The genuine demand for interaction between the layers has turned these interfaces and data formats into micro infrastructural elements (MIEs). How the law governs MIEs at this micro level will have a fundamental impact on how we want the software sector, or perhaps the 'new' economy to develop at the macro level: by innovation of a few undertakings, who dictate what consumers want and when they want, or by innovation of many undertakings, who compete for ever diversifying consumer demand and market opportunities. The answer is not as obvious as the question sounds, because software is public goods. As software can be reproduced indefinitely at negligible marginal cost, a major issue for software developers is not how to sell software at the highest price possible, but how to sell it as quickly as possible to gain upper hand against rivals. Network effects therefore play a crucial role in developing the consumer base for the software developers, and the role of the MIEs is vital in the economy of public goods. Understanding what software developers want and what consumers want is the key to answer the thesis' question: when is the incumbent's refusal to license an MIE an abuse of a dominant position?

This thesis does not argue that copyright protection of the MIEs should be abandoned, but rather proposes limiting the right of refusal to license the MIEs, when the costs of exercising this right to consumers in the long run exceed the benefits. If network effects are inevitable to provide the incentives in making public goods, then these incentives should be available to all the market players, and ultimately network effects should benefit the consumers. The prevailing 'innovation defence' so far only focuses on the relationship between public goods and network effects. Admittedly, network effects are necessary to develop public goods, but why should consumers support the incumbent's network and not the entrant's network, and why

should innovation in one market be motivated by control of innovation in another vertically-integrated market? In this thesis, I look at network effects from another angle: consumer demand. Without a sufficient demand, there is no incentive and opportunity for innovation and the economy ceases to be dynamic. Once this dissimilarity between 'public goods-focused' and 'consumer-focused' model structures is recognised, the harmful effects of MIE control can be more readily identified and understood.

From consumer perspectives, switching suppliers in one product market would incur switching costs in another product market, if access to a relevant MIE were not granted. When the switching costs become higher than any utility surplus of a rival product, an unjustifiable refusal to license an MIE, or other conduct that keeps switching costs increased is an abuse. To confirm whether an abuse takes place, the court should follow the essentiality justification mechanism, and treat innovative markets differently from non-innovative markets.

CONCLUSIONS

As the above hypotheses have been developed, I have analysed the arguments supporting and challenging them, by both economic analysis and case study, from a simple environment (non-innovative markets) to a complex one (innovative markets). The hypotheses have been applied to the current essential facilities doctrine in the US and its brother, the 'exceptional circumstances' doctrine in Europe. I have applied this doctrine under the framework of the three-step test, Article 13 TRIPs. In this final part, I draw the general conclusions on the arguments made so far. Specific conclusions are not presented, as they have already been emphasized at the end of each chapter. After the conclusion, I will summarise the shortcomings in the analysis and suggest some directions for future research in the area of consumer demand.

On the definition of consumers and consumer welfare

Sections 1.5.1 and 3.1.2 have highlighted the importance of defining consumers and consumer welfare. The necessity to formulate a definition of consumer has been stated in

paragraphs 41 and 43 of the *Market Notice*. However, there is no general confirmation that consumers may include the corporate customers in the incumbent's market, and one need not look further than the key corporate customers to identify consumer detriment. Those are my arguments regarding the definition of consumers. The reason is that if the customers suffer detriment, they will be likely to pass it on to their own customers in downstream markets, and the snowball of detriment could continue to spin. Therefore, the customers' detriment in the incumbent's product market would suffice to indicate consumers' detriment. I have argued that for ascertaining abusive conduct, the consumers also include the corporate customers of the products whose functionality is controlled by the MIEs. Depending on the definition of consumers, we can then define whether the alleged conduct has caused harm or benefit to consumer welfare, following the three generic questions set forth in sections 1.2.1.b and 3.1.1:

- Does the alleged act create detriment to consumers?
- Is the act justifiable by a benefit to consumers?
- Will the benefit be larger than the detriment to consumers?

At its heart, an analysis of consumer welfare is a cost-benefit analysis from the standpoint of consumers' long-term interests, taking into account legitimate interests of the incumbent. Cost-benefit analysis is the thread connecting the sections and arguments put across in this thesis.

On detriment to consumers and switching costs

The starting point of analysing consumer welfare is to identify detriment to consumers. Competition law should address two types of detriments. The first type is indirect detriment: what consumers suffer in terms of losing the utility surplus ($\Delta U = U_2 - U_1$), for example the loss from being forced to use sub-optimal products, which has been the case of inefficient switching and bundling (see sections 4.2.2.b and 4.3). The surplus ΔU is what the consumers should have gained if they are not locked-in in a product market with high switching costs. The

second type is direct detriment: what the consumers suffer in terms of money lost from the incumbent's conduct, such as price increases or forced upgrade (see section 4.2). In both cases, switching costs are a relevant factor.

The concept of switching costs has been mentioned at paragraph 42 of the *Market Notice*. However, it is not conclusive whether these costs are the source of detriment to consumers. In sections 3.2 and 3.3, by introducing the concept of indirect switching costs and the formula $S < \Delta U$ for switching conditions, I submit that:

- 1) When ΔU is subject to a maximum threshold, and S increases indefinitely as the consumers keep investing in the incumbent's network, switching costs will become a barrier to exit for the consumers. As any effort of the competitors to bring consumer benefits will be ineffective when $Min S > Max \Delta U$, the solution is not to increase ΔU , but to decrease S .
- 2) When $Max \Delta U$ is not identified, but the incumbent nevertheless intentionally increases switching costs so that $S > \Delta U$; the consumers must use a sub-optimal product, risking eliminating competition in such a product market, this intentional increase in switching costs is an abuse. If an MIE license help consumers to reduce switching costs, a competent antitrust authority may grant such a license.

On the distinction between the innovative and the non-innovative markets

While S could be calculated by answering, among others, what costs the consumers will bear, in order to reuse or to forfeit their MIE-related investments, calculating ΔU is far from simple. When the market is non-innovative (i.e., there is no demand for innovation in the market), suppliers will compete on price and services only. The calculation of $Max \Delta U$ is feasible. On the contrary, when the market is innovative and dynamic, $Max \Delta U$ is difficult to ascertain, because there is no 'fixed' utility to start with. Detriment to consumers in non-innovative markets should be treated differently from the detriment in innovative ones.

In a non-innovative market, consumers suffer detriment when the condition $S > \text{Max } \Delta U$ is satisfied (see sections 3.4 and 3.5).

In an innovative market, consumers suffer detriment when one of the two scenarios materialised. Firstly, as discussed in section 4.2, the incumbent exercises the practices of price increases, forced upgrade or forced switching, which cause real detriment to consumers in terms of money loss. Secondly, the incumbent uses the bundling tactic to leverage monopoly power from one market to another, taking the long-term strategy to raise switching costs in the targeted market (see section 4.3). When the negative effect of bundling by default on consumer welfare becomes certain, a competent antitrust authority can require the incumbent to unbundle part of the incumbent's platform, so that rival products can compete in the incumbent's product 'on merits'. This solution facilitates competition in the downstream market, but does not deny the consumers' benefits stemming from bundled products.

On sunk costs and free riding

Granting an MIE license however provides a solution to only half of the question. The aftermath of an MIE license must be considered: will the license severely affect the incentive to innovate of the market players? To answer this question, we need to analyse two risks associated with any public goods: sunk costs and free riding. With respect to the sunk cost concern, section 5.2 has rebutted the traditional beliefs. With respect to the free riding concern, section 5.4 has suggested that courts should allow the incumbent to limit the number of entrants with access to the MIE. The most effective way to limit the number of the entrants is by charging an access fee to the MIE, equivalent to the costs of building or maintaining the MIE, so that later both the incumbent and the entrants can compete on a level playing field.

With respect to the MIE license fees, section 5.3 has postulated that the court should not be concerned too much about not having a perfect mechanism to calculate access price. As long as it requires the incumbent to open access to the MIE and require the parties to negotiate for an access price along the line of the Rubinstein bargaining model, the incumbent will offer a fair

price. The incumbent may even anticipate the threat of a compulsory license and actively seek a capable licensee. Nevertheless, he must be allowed to recover the *ex ante* R&D expenditure on MIE promotion in the relevant market to have sufficient incentives to innovate (see section 5.2.2). If such expenditure is not recoverable, the incumbent can refuse to license the MIE.

On the essentiality-justification mechanism and the EFD

Section 5.5 has proposed a checklist of questions to be answered before granting an MIE compulsory license. The checklist is divided into two requirements (1) for the entrant to prove that the elements to which access is sought was an MIE, and that access would bring benefits to the consumers, and afterwards (2) for the incumbent to justify its refusal to license on the grounds of free riding and sunk cost risks. This checklist is entitled the essentiality-justification mechanism. The first step yields information about the benefits of MIE access. The second step furnishes the costs of the MIE license. This essentiality-justification mechanism is essentially a procedural rule that facilitate a cost-benefit analysis process. This could be an antitrust litigation proceeding before a US district court, a competition investigation before the European Commission, or a main proceeding under *action direct* before the CFI.

According to the theory of information asymmetry, those who are most likely to have it should provide information. Therefore, the claimant should bear the burden of proof in the ‘essentiality’ step, and the respondent should bear the burden of proof in the ‘justification’ step. This balance of the burden of proof has been the norm in the procedures regarding Article 81 EC and the US rule of reason, but not yet in the Article 82 EC procedure. The application of the essentiality-justification mechanism should not only limit to switching costs cases, but should also extend to any Article 82 EC cases.

Through case studies, Chapter 6 has shown that the application of the essential facilities doctrine (EFD) would be more transparent and consistent if, on the substantive side, the switching costs factor is analysed and the different treatment between innovative and non-innovative markets is recognised; and, on the procedural side, the antitrust authority follows the

essentiality-justification mechanism. For example, the decision in *Volvo* was different from the *Magill* decision because in *Volvo* the benefits of access to the consumers have been less than they were in *Magill*; and the costs of free riding to the incumbent in *Volvo* have been higher than they were in *Magill*. In *IMS*, the judgement should be in favour of an MIE license or equivalent measures to unlock the consumers, because notwithstanding hypothetical concerns of *IMS*, the cost-benefit analysis does not justify a refusal to license.

With respect to the EFD, I have submitted, apart from the essentiality-justification mechanism, that the essentiality of the facility is not “essential for the entrants” but “essential for reducing or preventing the consumer detriment.” Intellectual property rights in a facility do not change the fact that such a facility causes detriment to consumers. Whether the EFD should be applied is not a question of law but a matter of fact. The court should not think of ‘non-discriminatory’ access while applying the EFD, for it would leave loopholes to free riders. A more feasible option would be that entrants could have access only if they have a capacity to bring benefits to consumers.

On the three-step test and the fair use doctrine

One may object that a modification of the EFD would give rise to inconsistency with the TRIPs three-step test, but as argued in Chapter 7 this test from the very beginning has not been suitable to cover antitrust exceptions to copyright if we follow the plain meaning of their words. A solution to this conflict would be to replace the three-step test with the US fair use doctrine. An alternative would be to replace ‘a normal exploitation’ with ‘the normal exploitation’ in the three-step tests, or to adopt Karnell’s interpretation. Through analysing the fair use doctrine, I have submitted that at the heart of an exception to copyright should be a cost-benefit analysis. When the exercise of intellectual property rights does more harm than good to consumers, it should be limited. On the other hand, if an exception to copyright gives rise to another market failure bigger than the failure it solved, such an exception should not be granted. This summary is in line with the conclusion on the EFD and the essentiality-justification mechanism. Nevertheless, it seems too late to follow this option, and the most feasible option for the time

being is to adopt Karnell's interpretation. That is, 'not conflict with a normal exploitation' means non-abusive exploitation, following normal trading methods and allow competitors to compete with the rightholders on the merits.

SOME DIRECTIONS FOR FUTURE RESEARCH

It is not my ambition to provide the final answer to refusal to license questions. As presented below more work on refusal to license and related economic concepts are warranted.

Extension of the hypotheses' application

Throughout the chapters, I have focused on one sector (software), one factor (switching costs) and one situation (refusal to license). However, the Formula $S > \Delta U$ could be applicable beyond software markets, whenever consumer utility surplus in a relevant market is subject to a maximum threshold and network effects are high. The clearest application is to the markets for spare parts, as can be seen in *Volvo*, *Renault*, *Hugin* or *Kodak*. In addition, as refusal to license is a specific case of a larger theory – leverage of market power, the lessons from refusal to license cases may be studied to apply in other leveraging cases such as tie-in. Similarly, many lessons for the software sector can be drawn from studying the cases involving spare parts, in which the research of Govaere (1996) and Anderman (1998) is outstanding. What is more, the discussion about the MIEs is not limited to the copyright context. Granstrand (1999) and Larouche (2000) have demonstrated similar arguments about network effects and network controls through 'bottlenecks' in the fields of patent and other intellectual property rights. As OECD (2000a) reported, there has been a tendency to exploit network effects whenever possible, not limited to the markets for public goods. As such, more studies of the impact of network effects on competition law and intellectual property law are needed.

As noted in section 6.1, the application of the essentiality-justification mechanism is not limited to the switching costs cases, but it may extend to other cases concerning refusal to license. This prediction is not new. The necessity to separate the 'essentiality' part from the

'justification' part in a EFD has been suggested by Anderman (2002) and Goyder (2003), with focus on the detriment to consumers. Regarding the 'justification' part, I hypothesize in section 5.4 that as long as the risks of sunk costs and free riding are adequately addressed, the incumbent and the entrant will have the incentives to innovate. However, I do not shed light on what will be the optimal incentives to innovate. This issue has been addressed by Cornes and Sandler (1997), Scotchmer (1998) and Quah (2002), but my knowledge of mathematics does not allow me to extend the scope of research that far.

Extension of the non-economic arguments

The thesis' scope of discussion is limited to law and economics. I have not considered non-economic arguments, such as social norms or moral rights of copyright protection. It is hoped that by adding new factual issues and proposing procedural changes to the current law rather than questioning the legitimacy of the law, this thesis would 'do no harm' to the moral and social values that stand for the rights of the rightholders. In addition, by supporting consumer freedom of choice and freedom in the relationship between human and technology, my findings on switching costs and the essentiality-justification mechanism have attempted to provide a moral justification for the MIE license when freedom is at risk. Friedman (1962), Netanel (1990) and Gordon (1993) have highlighted the importance of freedom of choice and consumer interests. These and other papers have contributed substantially to understanding of copyright on both economic and moral grounds. How to reconcile the freedom to pursue business of the incumbent, and freedom of choice of the consumers is a continuing debate, and moral arguments are of no less importance than economic arguments.

The economy of public goods

This thesis attempts to propose a new way to look at an old issue. I have taken the position that sufficient elements from the old EFD and fair use doctrine exist to support the essentiality and justification mechanism. However, the economy of public goods has many characteristics that are different from the economy of private goods. Monopolists in the 'new' economy would

not aim to limit production or raise prices, as conventional wisdom would have thought. What the monopolists want could be the opposite: to increase production and reduce prices, as can be seen in bundling cases. Moreover, unlike predatory pricing, which has only a temporary effect, bundling can be a long-term policy of a monopolist, which apparently benefits the consumers. The sharp contradiction between the two approaches of using market power requires further research. To estimate detriment to consumers, I have applied different approaches to two market categories: innovative or non-innovative. While this thesis might have proved detriment to consumers in a non-innovative market, the proof of detriment in an innovative market will need more supportive evidence to show its negative impact on consumer welfare.

Balance of probabilities

In Chapter 4, probabilities are referred to by qualitative methods, through case studies, common sense and experience rather than quantitative methods, such as statistics and surveys; therefore, some may question their reliability, particularly with respect to innovative markets. Qualitative methods are helpful as far as it could confirm or negate whether a particular market is a non-innovative market, but it may not reveal how much innovation the consumers need in an innovative market and for how long. More quantitative study of probabilities on detriment to consumers, such as consumer surveys or historical study of the impact of bundling on innovation is therefore needed. The survey of the Commission in *Microsoft Europe* (see section 4.4), as well as the study of technology diffusion of Granstrand, albeit in the field of patents (1999) represent valuable sources of reference for further research in the new economy. Broadly speaking, probability study is a promising area, which could eventually replace hypothetical discussions between ‘too much protection’ and ‘too little protection’, as Sunstein (2002) and Posner (2000) point out.

Pricing the minimum MIE access fee

The calculation of the minimum price that the incumbent could charge the entrant for an access price (*II*) needs to be tested in real case. The idea behind the minimum access price is

that the entrants should take a fair share of the incumbent's costs in developing the network, access to which they are enjoying. Such a share will depend on the strength of the relevant market in the multi-layered network, and the strength of the entrant. In section 5.2.2.b, I have proposed that this price should be proportional to the costs that the incumbent has incurred to promote the MIE and the loss of market share after the MIE access is granted. This formula is influenced by the Baumol-Sidak efficient component pricing (ECP) method, but it has not been tested in real cases. Research from Black (2000) and Larouche (2000) have addressed some of these issues, but more needs to be done. This method has not been tested also because none of the cases involving refusal to license in Europe or in the US has been disputed over access prices. The reality is that as soon as the incumbent is forced to grant an MIE license, the parties will agree on the access price outside the court.

I hope that the calculation of *II* would not be necessary, if the threats of the MIE license and the Rubinstein bargaining mechanism would be credible enough for the incumbent to both parties to come up with an agreed access price, as shown in the settlement between Sun and Microsoft on 2 April 2004, in the aftermath of the Microsoft Europe Decision.³⁰⁶ Moreover, the conclusion that the Rubinstein's delay-matters rule can force the parties to bargain for a fair access price is a robust model. I have conducted a number of fieldwork experimental surveys, and several studies before me have confirmed this hypothesis (see section 5.3.1). Thus, access fees might not be as crucial to the incumbent in practice as they seem to be in theory.

Amendment to the three-step test and TRIPs

In section 7.4, I have suggested that Article 13 TRIPs (the three-step test) should be amended. Such a change could be supported by developing countries but may face opposition from a number of developed countries, which believe that TRIPs is the minimum protection level and its protection standard could only increase. They may be further believed that TRIPs negotiation is a non-cooperative game. In this game, tit for tat and credible threat are useful

³⁰⁶ Guth, R. and Clark, D. "Secret talk lead to truce among technology giants" WSJ Europe 5 Apr. 2004:A1.

strategies.³⁰⁷ However, non-cooperative games have costs. Unwilling developing countries could circumvent TRIPs requirements or delay enforcement. Developed countries may retaliate, incurring high transaction costs (enforcement costs). These transaction costs will impede international trade and disappoint both developed and developing countries. To turn a non-cooperative TRIPs game into a cooperative one, several initiatives have been suggested,³⁰⁸ focusing on restoration of equal bargaining powers between developed and developing countries. However, hoping developing countries will gain bargaining powers equal to developed countries is unrealistic. Further research in this direction might not be fruitful.

Another direction of research is to find in the laws of developed countries the principles that favour of the interests of consumers and adopt them into the laws of developing countries. Following this direction, developing countries should adopt a copyright exception provision similar to the US fair use doctrine. As set forth in Chapter 7, they should be able to explain to developed countries why an adoption of the fair use doctrine is plausible at national level.

* * *

³⁰⁷ According to Reichman and Lange (1997: 35), developed countries believe that “top-down pressures ... will suffice to keep the developing countries ... cooperating fully in the implementation process.”

³⁰⁸ The first initiative originates from the UK government under the title “making globalisation work for the poor.” It organised a Commission for Intellectual Property Rights (CIPR) to study the impact of TRIPs on developing countries. The CIPR Report (2002) suggested that developing countries should act together and bring proposals that suit their interests to the next TRIPs revision. This proposal fails at three points. Firstly, no matter how united the developing countries are, in terms of bargaining power they cannot be stronger than developed countries. Secondly, responding to a non-cooperative game with non-cooperative strategies will lead to deal breaking and further misery. Thirdly, cooperation among poor countries will not last long. If one country defects, other countries will follow. The second initiative comes from Reichman and Lange (1997: 36) and Odekiji (2002). These studies suggest that private multinational firms should make agreements in advance with governments from developing countries. Private companies would not be targeted by hostile competition rules or reluctant intellectual property rights protection, in exchange for their commitment that they will not abuse intellectual property rights. In reality however, multinational companies need not negotiate with developing countries to enforce TRIPs. They can pressure developing nations through their home countries, to bring the case before the WTO dispute settlement body.

“There never comes a point where a theory can be said to be true. The most that anyone can claim for any theory is that it has shared the successes of all rivals and that it has passed at least one test which they have failed.”

A. Ayer, *Philosophy in the Twentieth Century*, 1982.

I hope this thesis stimulates research into these and other areas of detriment to consumers in networked economies. My intention is to demonstrate the advantages of applying a number of concepts; namely the differences between innovative and non-innovative markets, switching costs, utility surplus, game theory, and the cost-benefit analysis, to the study of abuse of a dominant position. At the final stage of this thesis, I was happy to learn that both the *Microsoft Europe Decision* (issued on 21 March 2004) and the *IMS judgement* (C-418/01, delivered on 29 April 2004) have confirmed the role of switching costs and the cost-benefit analysis approach. However, still more work along these lines is needed.

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