

MICROSOFT EUROPE AND SWITCHING COSTS

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Abstract

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 otherwise justified on the grounds of sunk costs and free riding.

MICROSOFT EUROPE AND SWITCHING COSTS

Net Le¹

“There is a question of fact whether information costs and switching costs foil the simple assumption that the [upstream and downstream] markets act as pure complements to each other.”

Justice Blackmun, *Eastman Kodak v Image Technical Services, et al.* [1992] 504 US 451, para. 40.

On 21 April 2004, the European Commission published a Decision concluding its review of the Microsoft case after more than five years (“Microsoft Europe”).² On the same day, Microsoft issued a press release defending its position (“Release”).³ According to the Decision, Microsoft has abused dominant position by (1) creating interoperability between its product and rival products, and (2) bundling new products into a product it holds monopoly power – the Windows desktop operating system. Microsoft, on the other hand, objected that the Decision has punished the business models that have brought benefits to the consumers, under the flag of ‘protection of innovation’. Indeed, with R&D budgets larger than any other software developers (\$5-6 billions annually), there is no evidence that Microsoft products will be any less innovative than those of competitors.

Departing from the centre of discussion in Microsoft Europe, in this article I will highlight a factor that might have been underestimated in this case – consumers’ switching

¹ Law Department, London School of Economics and Political Science. I would like to thank Mr. Thomas Vinje from Clifford Chance Brussels and Mr. Nicolas Banasevic from the European Commission, DG Competition have commented on the draft. The concepts presented here and their mistakes are mine.

² Commission Decision of 24 March 2004 relating to a proceeding under Article 82 of the EC Treaty (Case COMP/C-3/37.792 Microsoft), C(2004)900 final (21 April 2004).

³ <http://download.microsoft.com/download/5/2/7/52794f65-8784-43cf-8651-c7d9e7d34f90/Comment%20on%20EC%20%20Microsoft%20Decision.pdf>.

costs, to prove that the Commission could have reached the same conclusion by answering to Microsoft's direct challenge – that its conduct is detrimental to the consumers; rather than merely focusing on the elimination of competition, an effect that is more controversial, especially in the markets of public and durable goods such as software. To be brief, I will not repeat the main arguments in the Microsoft Europe Decision, but will put the challenges of Microsoft on the spotlight, with the question: what are the detriment to consumers from Microsoft's conduct (section 1). Section 2 will introduce the concept of switching costs and the relationship between these costs and consumer detriment. Section 3 will analyse the consumer detriment in the first question of Microsoft Europe (the 'interoperability' question). Section 4 will show the detriment in the second question of the same decision (the 'bundling' question). To avoid going into details well-established issues, we will assume at the beginning that:

- Microsoft holds dominant position in the market for operating systems (OSs).
- The software sector is build by layers, one upon another: application programs, desktop OSs, and server OSs. Markets in each layer are characterised by network effects and compatibility requirements. That is, an application program must be compatible with a desktop OS in order for the former to function properly. To maintain interoperability, the application program must have its application programming interfaces (APIs) compatible with the correspondent APIs of the OS.
- One of the consequences when a market becomes monopolised is that the consumers' choice in this market will be limited (to the monopolist's product).

The key issue in the discussion is whether Microsoft conduct has created consumer detriments in a market with rising switching costs, contrary to what it claimed. Apart from economic issues, references will also be made to a number of case-law, most notably *Tetra Pak v Commission (Tetra Pak II, T-83/91, C-333/91)*. Comparison will be made with the US approach in *Kodak v Technical Image Service* [1992] 504 US 451, to address the recent

concern from the Microsoft and the US government that Microsoft Europe has departed from the US approach on dealing with refusal to supply cases (Release, p. 4).

1. THE MICROSOFT CASE AND DETRIMENT TO CONSUMERS

1.1 THE INVESTIGATION AGAINST MICROSOFT IN EUROPE

The European Commission started investigating Microsoft in December 1998, following the complaint of Sun Microsystems on the interoperability issue. The latter has alleged that Microsoft refused to provide it with necessary application programming interfaces (APIs) in its desktop OS – Windows 98 (“Windows”). As a result, Sun server OS had performed some features with greater difficulties, such as printing synchronisation, and could not match some features that are possible when a user has Microsoft products in both desktop and servers –Windows and Windows NT (“NT”), such as setting up a single password for users to login to multiple systems.⁴

The ‘bundling’ question came in 2003, with the complaint of the Computer and Communication Industries Association (CCIA) that Microsoft has bundled their media player – Windows Media Player (‘WMP’) into Windows by default.⁵ As the consumers have been offered with WMP, Microsoft’s competitors such as RealNetworks or Apple alleged that the former will no longer desire their products. As a consequence, the downstream market for media players are biased toward WMP.

⁴ Microsoft Europe, para. 252-279.

⁵ 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 contents that are accepted by media players are formatted either in public standards, such as *.mp3*, *.mpga*, *.m3u*, *.mpeg*, *.mpg*, *.mpa*, *.mpga*, *.avi*, *.au*, *.aiff*, *.aif*; or in private standards 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 player 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, iTunes, QuickTime and WMP, apart from the products of other developers, such as Winamp of Nullsoft or Jukebox of MusicMatch.

Apparently, both the ‘interoperability’ and the ‘bundling’ questions can be considered as an abuse of dominant position, which is prohibited under Article 82 EC (placing competitors at disadvantages and tying arrangement – paragraph c and d). Microsoft has defended their tactics on two main grounds: intellectual property rights and meeting the consumer demand.

With respect to the interoperability question, Microsoft argued that it did not effectively preclude competition in the server OS market (Release, p. 2-3). In this market, the share of not only Windows NT but also Linux has been increased, showing that the ‘interoperability’ problem is not a major issue for Microsoft’s rivals.⁶ Sun and other competitors still access to Microsoft’s desktop OS. Admittedly, their server OSs are not as compatible to Windows 98/XP as Windows NT does, but it has no obligation to treat competitor’s products in the same manner as its own product. Like a person can treat his/her child better than the children of others, Microsoft has the right to treat NT better than rival products. After all, Microsoft holds copyright in both Windows and NT, including the APIs, together with several associated patents. If we refer to a US case law, in *Verizon v Trinko* (judgement dated 13 January 2004 of the Supreme Court, section III), the Justice Scalia also held that access to an essential facility (in this case the APIs) is granted when there is no access, not when such access is inadequate or discriminatory.

With respect to the bundling question, Microsoft argued that its tactic is a tested and tried business method that responds to consumer demand. Had the Commission conducted a surveys as to whether the consumers prefer an operating system without a media player from an operating system with a media player, the answer would be predictable: the consumers would like to have a bundled product (Release, p. 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 will undoubtedly foreclose competitors, but it is only a side effect; its harm to society is smaller

⁶ By 2003, the world-wide server revenue by OS is Unix (\$16.65 billion, down \$1.8 billion from 2002), Windows NT (\$15.01 billion, up \$2.3 billion during the same time), Linux (\$3.22 billion, up \$1.1 billion) and others (\$11.23 billion, down \$0.35 billion). See Gartner Dataquest, *WSJ Europe* 5 Apr. 2004: A1.

than the benefits that bundling can bring to consumers. 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.

Overall, Microsoft's arguments aim at consumer welfare enhancement. Microsoft does not deny that its practices may create difficulties for a rival to compete, but likewise their practices also bring consumer benefits. Admittedly, rivals' innovation can be stifled, but the innovation process of society as a whole would not be retarded. The IBM settlement ([1981] ECR 263) is an example.⁷ In addition, even if the market becomes monopolised as a result of bundling, the monopolist still innovates and thus the consumers still receive benefit. Microsoft invested in R&D more than other software developers did (US\$5 billion in 2001). Such a large R&D budget must have brought some benefits to the consumers.

Moving from the above, to prove that Microsoft's conduct is abusive, the Commission needs to identify the detriment of such conduct to consumers. The burden of proof is on the Commission's side. Unfortunately, this is the weakest point in the Commission's decision (Microsoft Europe, section 5.3). The decision only held that Microsoft's conduct stifles innovation of competitors, without showing that innovation in society as a whole has been retarded. The decision only held that consumers have less choice when a single firm dominates a market, without showing a concrete example of consumer detriment in terms of money loss.

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

⁷ 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 (See Katz and Shapiro, 1999: 29-30; Anderman, 1998: 199; and 9. 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. However, the latter have never become more innovative than IBM or Intel (Davies and Harrison, 2001). See also Posner (1998b: 232) for an investigation against IBM in the US.

producer before entering a market are: how many units of products he can produce (Q) and at what price (P), so that he can cover the costs and gain profits. In a market for public good, e.g., software, the marginal cost is close to zero, therefore the above two questions now become one: how to enlarge the quantity of units sold. The answer is: low price and exploitation of network effects, including vertical ‘integration’. The latter concept is underpinned by the interoperability and bundling between the ‘upstream’ and the ‘downstream’ products. That is why bundling has become a popular practice of not only Microsoft but also RealNetworks and other software firms; so is the prevention of interoperability between products whenever it is profitable for the consumers.

In reality, bundling and the prevention of interoperability has been exercised by Microsoft in several occasions, most notably in its foreclosure of Netscape, the pioneer Internet browser. In *US v Microsoft* [1999] 165 F.3d 952, the Columbia District Court 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 is the innovation in Netscape, Opera or any other browsers. The Cicero’s question – *cui bono* (who will benefit [from the decision]?) is still unanswered.

1.2 WHAT IS THE DETRIMENT TO CONSUMERS?

This work starts with a definition that a detriment to consumers is a loss of utility to them. This hypothesis can be explained by the following formula. In this formula we will choose utility to represent the consumer’s interests. Suppose that there are two products: 1 and 2, having utility U_1 and U_2 , respectively. Consumers are rational and self-interested, and information is complete. Where $U_1 < U_2$, 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 the detriment to consumers.

The postulation that a loss of an opportunity to gain utility, or a dissatisfaction of a consumer demand may amount to a consumer detriment is confirmed by many cases, both in Europe and the US. In *Magill* [1995] ECR I-743, the ECJ held that an exceptional circumstance, which would trigger Article 82 EC, arises if there was a specific, constant and regular potential demand on the part of the consumers (paras. 52). In *Bronner* [1997] ECR II-923, para. 131, the Court held that the consumers can be prejudiced where they have a ‘specific, constant and regular’ potential demand for a new and available product, but this demand is not satisfied by the incumbent without any justification. Likewise, in *Kodak v Technical Image Services* [1992] 504 US 451, justice Blackmun has shown that consumers would suffer from information costs and switching costs if they are locked in to a service market. Such a lock-in harms them if they cannot buy the service they want (para. 50).

2. CONSUMER SWITCHING COSTS

2.1 THE DEFINITION OF 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 Farrell and Shapiro (1988), “switching costs is the monetary equivalent of the inconvenience imposed on the user due to changing provider.”⁸ The common point among these definitions is that switching costs

⁸ Farrell and Shapiro (1988) “Dynamic competition with switching costs” 19 *RAND J of Econ.* 1: 123-37; Farrell and Klemperer (2002) *Coordination and lock-in: competition with switching costs and network effects*, see www.paulklempere.org; Klemperer (1987) “The competitiveness of markets with switching costs” 18 *RAND J of Econ.* 1: 137; Von Weizacker (1980) “The cost of substitution” *Econometrica* 52: 1085; Chen and Hitt (2001) *Measuring switching costs and their determinants in Internet-enabled business*, Wharton seminar paper, see www.oz.stern.nyu.edu.

indicate stickiness in consumer's choice. Para. 42 of the *Market Notice* has mentioned the concept of switching costs as follows:

“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, need to incur specific capital investment 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, uncertainty about quality and reputation of unknown suppliers, and others.”

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.⁹

2.2 DIRECT AND INDIRECT SWITCHING COSTS

Do switching costs create a positive or a negative effect on the consumers? Academic opinion is still divided. Klemperer (1988) argues that when switching costs have already burdened the consumers, entry of the incumbent's rivals may create market confusion and

⁹ Gartner Dataquest (2003) *Linux on the Desktop: The Whole Story*, report No. AV-2-6574, by Smith, Simpson, Silver and Fiering.

decrease consumer welfare. On the other hand, Nilssen (1992: 583) demonstrates that when the consumers are affected by switching costs, the incumbent may raise prices and harm the consumers.¹⁰ Chen and Hitt (2001: 134-140) disagree. 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.¹¹ 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 the consumers, and prevents them from inefficient switching.

Without a separation between switching costs and utility, one may not ascertain a detriment to consumers. Suppose that consumers are self-interested, they would obviously want to maximise their utility. If utility is a part of switching costs, the consumers can internalise these costs. Otherwise, switching costs are externalities. 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 switching costs (which can be internalised in the product's utility) and exogenous switching costs (which are beyond the product's utility, i.e., externality). Endogenous switching costs are the 'direct' costs, and exogenous switching costs are the 'indirect' costs. 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.¹² If

¹⁰ Nilssen (1992) "Two kinds of consumer switching costs" 23 *RAND J of Econ.* 4: 579-589.

¹¹ 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.

¹² 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).

the consumer decides to switch, he must forgo the utility he 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. Opportunity costs are zero, because they are lost anyway without being compensated by utility. These costs become ‘sunk’.

Because indirect switching costs are sunk costs, they *may* provoke detriment to consumers. The issue now is who should be responsible for such detriment. The argument put across is that if the indirect switching costs are unavoidable, they are not a detriment but an expense that consumers must calculate when they switch. If these costs can be avoided effectively by the incumbent’s thoughtful conduct, there is a duty of care to do so upon the incumbent. This postulation is underpinned by the rule set forth by Judge Learned Hand in *US v Carroll Towing* [1947] 159 F.2d 169.

The Hand Rule asserts that the burden to bear the duty of care (B) should be allocated to reduce the probability (p) to prevent the loss (L). A duty of care should be imposed to a party if $B < pL$; or $L = B/p$. Suppose that the burden of the victim to take care of himself against the risk of loss is B_1 , the probability of the loss when care is taken is p_1 , the burden of the injurer to take care of the victim’s interests is B_2 , and the probability of the same loss when care is taken is p_2 . For the same loss, we have $B_1/p_1 = B_2/p_2$. Therefore if $p_2 < p_1$ (if the injurer can avoid the loss more easily) we have $B_2 > B_1$; the injurer should bear the duty of care because it is less burdensome for him to take it. The duty of care should be imposed on the party that can avoid the risks for the other party at a lower cost.

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

Please note that it is possible for indirect switching costs to cause both detriment and benefit to the consumers, such as those accumulated from network effects. Network control can result in harmful effects to the consumers, in which they can be locked (see the example of Vodafone above). At the same time, network and standardisation may respond to consumer demand and therefore bring consumer benefits. An imperative for this problem is to pursue a policy that remedies the negative impact without prejudicing the positive impact of the network effects. In summary, the discourse on switching costs should be divided as shown in Figure 1 below.

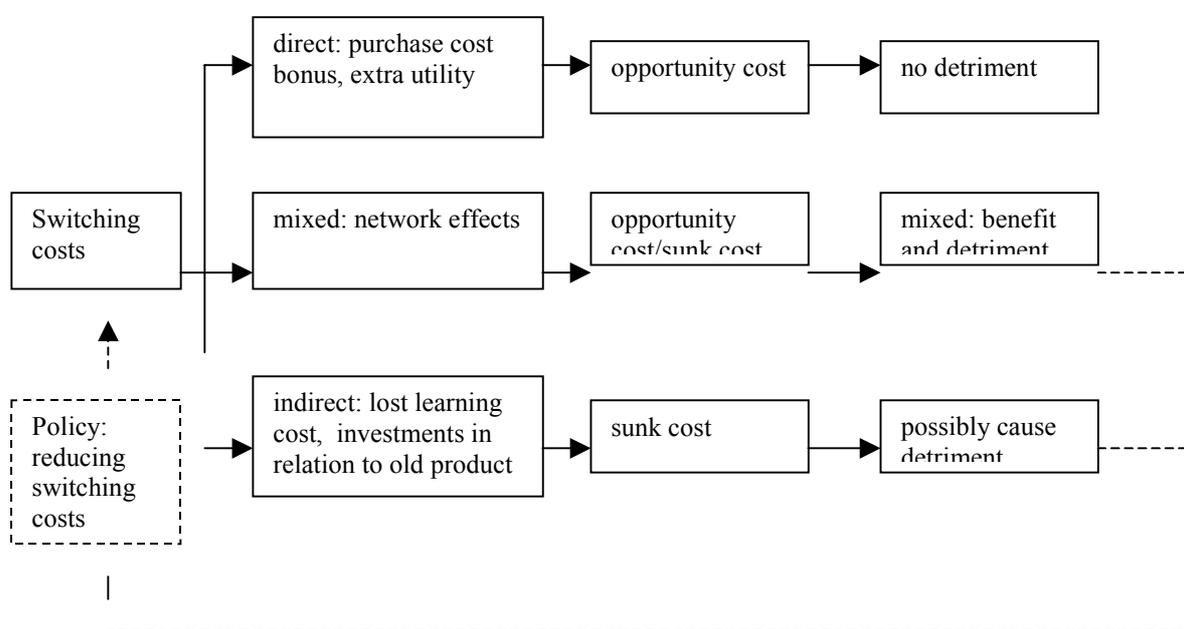


Figure 1: switching costs and the possibility of consumer detriment

2.3 SWITCHING COSTS AND CASE LAW

Although switching costs have been identified in the *Market Notice*, its implementation in case law is still limited. Switching costs were an issue only two cases in the US (*Lotus v Borland* [1993] 34 USPQ.2d 1014 ad *Kodak*) and one case in Europe (*IMS Health*, C-418/01, pending ECJ decision). Notwithstanding the rare examples, they show that a case would have been easily understood if this factor is taken into account. As the end of

competition law is to promote consumer welfare, an act that cause consumer detriment, measured by the switching costs obviously run against what the law stands to protect.

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* and could not be copyrighted (functional element, see section 2.2.1). Baird *et al.* (1994: 237) commented that in reality the spreadsheet presentation was not a *scene a faire*.¹³ However, if the judgment were held in favour of Lotus, switching costs to the consumers would have been increased. The *dicta* in *Lotus* has also indicated that the Court was ready to accept Lotus' refusal to license if the risks of free riding or sunk costs were too high.¹⁴ "Borland is merely trying to give former Lotus users an option to exploit their own prior investment in learning or in macros."

In *Kodak*, the incumbent defended its tying conduct by the argument that he did not overprice the consumers for services, because otherwise the consumers would have switched to a different product. Justice Blackmun has dismissed this argument, referring *inter alia* to the switching costs factor. In paras. 37-39, Mr. Justice noted that locked-in consumers will tolerate some level 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).

¹³ Baird, Gertner and Picker (1994) *Game theory and the law*. Harvard Univ. Press.

¹⁴ 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.

IMS Health involves another type of switching costs, this being the past investment of the consumers in data collection. The European Commission has 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 the consumers not to use IMS's data format and opt for other data providers.¹⁵ 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,¹⁶ as a change in the data format would lead to the loss of relationships between doctors and sale representatives.¹⁷ 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 more than 100 percent of the annual budget for regional sales data.”

Countering the Commission's finding, IMS has argued that the switching costs incurred, being the contribution of its customers to IMS's data format, is a normal expenditure and irrelevant to the consideration. Advocate General Tizzano has rejected this argument. At para. 80 and 82 of his opinion, Mr. Tizzano has quoted the *Bronner* judgement (para. 45-46) to argue that consumers' expenditure constitutes a 'financial obstacle' that make it

¹⁵ Commission Decision 2001/165/EC of 3 July 2001 (COMP D3/38.044). The Commission's investigation looked at whether there was a real and practical possibility for firms to use another structure which would not infringe IMS' copyright. The 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. This decision has been withdrawn when the case has been settled in a German court, whereby IMS's competitors can use the postcodes to build their own pharmaceutical data formats.

¹⁶ *Id.*, para. 111-12, interview with Bayer, AstraZeneca, Hoffman La Roche, Eli Lilly and Mediac.

¹⁷ 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.

‘impossible or unreasonably difficult’ for any entrant to subsidise the consumers.¹⁸ Mr. Tizzano concludes:

“The level of participation of the pharmaceutical undertakings (i.e., the consumers) in the development of *structure* protected by copyright and *effort* to be made ... in order to be able to acquire studies based on a [rival] structure ... are matters to be taken into account in establishing whether the structure is essential for [the consumers’ business].”

The “effort” refers to the costs that the consumers would incur in order to switch from the IMS standard to a rival standard. The Advocate General has therefore paved the way to recognise switching costs as a relevant argument in an Article 82 EC case. If the ECJ accepts the arguments of both the Commission and the Advocate General, a precedent could be set for the future where switching costs would be part of their consideration.

2.4 SWITCHING COSTS AND PARETO EFFICIENCY

In a perfect competitive market, the value of a product is dependent on the utility (U) it brings to the purchaser (product utility). From the seller’s viewpoint, such a value is reflected in the price (P). The transaction takes place when the consumer values U more than P . For any given product (i), we have (see e.g., Stiglitz and Driffill, 2001: 137):¹⁹

$$U_i \geq P_i \quad (*)$$

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

¹⁸ *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].”

¹⁹ Stiglitz and Driffill (2001) *Economics*. Norton Group.

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).²⁰ 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 $U_1 + S_1 \geq P_2 = U_2$

$$\text{or } S_1 \geq U_2 - U_1 = \Delta U \quad (I)$$

Thus between two products (1 and 2), and product 2 creates more efficiency/utility than product 1, the consumer will only switch to product 1 if: $U_2 \geq R_1 (= U_1 + S_1) \geq P_1$, or $\Delta U = U_2 - U_1 \geq S_1$ (1a).

Even if we assume that there are various constraints (C), there is still a causal link between price (P) and utility (u). Formula (1) now becomes $P_i \leq f(u_i) + C + S_i$, whereby f represents the causal link. If we denote $U_i = f(u_i) + C$, we still have the result as explained in formula (1).

Formula (1) 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:

$$R = S + C$$

Where:

- R is the reserved (maximum) price that the consumer would pay.
- C is the cost of buying a product (the product's price, or P in Werden's formula above).
- S is the switching costs related to the product.

²⁰ Werden (1997) "An economic perspective of the analysis of merger efficiency" *Antitrust*, Summer '97.

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

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

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 (1) above. However, there is a major difference in the approach that each formula takes. Formula (1) focuses on consumers' interests, as opposed to the formula of Farrell and Klemperer, which focuses on the suppliers' interests.

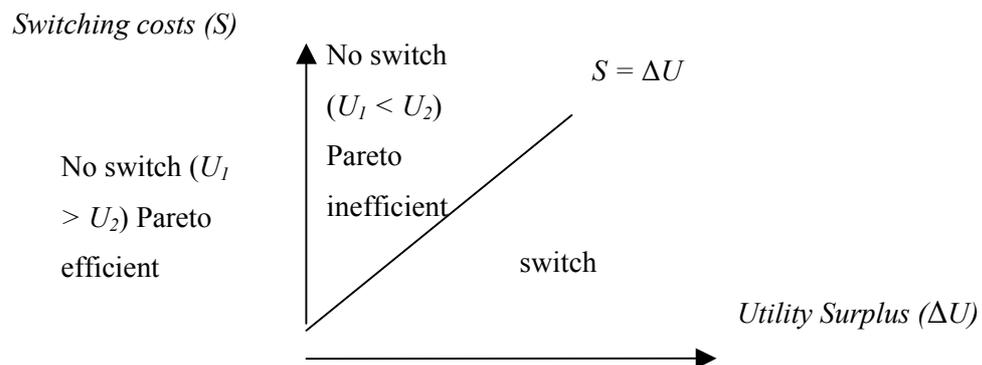


Figure 2: conditions for switching

The relationship between the switching costs and utility surplus is presented in Figure 2 above.²¹ According to Viscusi *et al.* (2001: 177-81), when the 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). This chart also shows that the larger the switching costs, the larger the utility surplus required for a switch.

²¹ 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.

We can see from Figures 2 and 3 that there are two scenarios where consumers suffer detriment from high switching costs:

- 1) Exploiting a situation where utility surplus cannot be higher 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 are kept rising. Consumers refuse to switch regardless of the utility surplus provided by the entrants when:

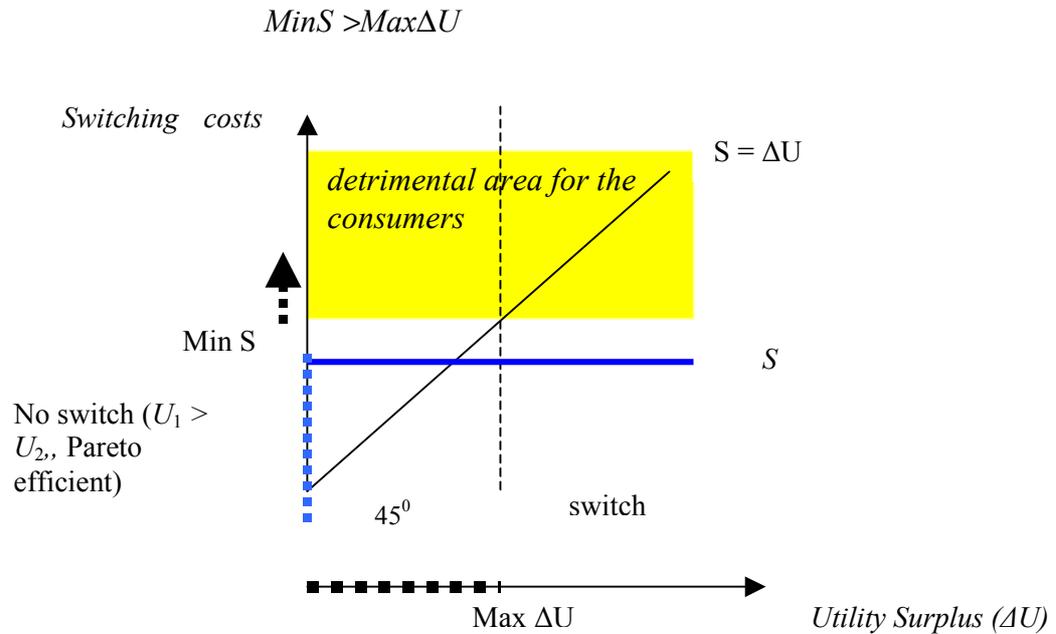


Figure 3: two methods to exploit switching costs

- 2) Raising switching costs. The raise of S creates a gap $\Delta U = S$ in the horizontal axiom (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 of 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 consumers (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

Among the factors that accumulate switching costs, two are relevant to the Microsoft case: network effects and the consumers’ investment in relation to the incumbent products, as shown in the surveys of Gartner Dataquest and META Group in section 2.1 above.

2.4 NETWORK EFFECTS AND INDIRECT INVESTMENTS

a. Network effects + incompatibility = switching costs

Network externalities can generate both the beneficiary and the detrimental effects to the consumers. On the one hand, network effects may result in consumer lock-in and solicit switching costs, especially when the standards in a network are incompatible with those in another network. On the other hand, they allow the consumers to communicate and coordinate with each other. The objective of law should be to minimise the detriment without losing the benefit of network effects. To that end, the standard of one network should be compatible with another. According to Farrell and Klemperer (2002: 3.8):

“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; firm 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.”

Indeed, although there are consumers who benefit from network effects, there is no extra benefit from the mere fact that a network is incompatible with another network, at least in the short-term. On the contrary, incompatibility will result in a loss of benefits of the old network when the consumers switch to a new one. There can be arguably long-term benefits from incompatibility, in that the network owner needs to reserve the network for his own so that he can have incentive to innovate and make his network better than the rival network. But according to this theory, one would have expected the network owner take advantage of system compatibility to encourage consumers in rival networks switching to his network. The strategy of incompatibility just goes to the opposite direction. A logic answer to these two conflicting theses could be that the network owner would like to create a forward compatibility to encourage consumers switching to his network; and to prevent backward compatibility to discourage consumers switching to a rival network, due to the high switching costs. But 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. 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. In other words, the networks will become incompatible, both forward and backward.

Another defence for network incompatibility is in the sunk costs recovery. Brian Arthur (1996) argues that when the incumbent subsidises the consumers to join his network, he expects some extra profits in return.²² Without the right to exploit the rent from the network externalities, firms would have no incentive to compete. For example, a mobile telecommunication carrier does not give away ‘free phones’ if the users only ‘pay as they go’. Again, this argument falls short if we analyse the game between the network owners. Network externalities require an increasing number of users. Following the same arguments as presented in the preceding paragraph, the players would not have incentive to provide system compatibility if they are not certain whether by creating both forward and backward compatibility, their networks will expand or reduce.

The above game between network owners would change if one of the networks were much larger than the other networks. The dominant network owner therefore would 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 with its after-sale services. It alleged that such a tie would 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. At para. 28 he held:

²² Brian Arthur (1996) “Increasing returns and the new world of business” *Harvard Business Rev.* No. 7-8/1996.

“According to [Kodak’s argument], one would have expected Kodak to take advantage of lower-priced service [of Kodak’s rival] as an opportunity to expand equipment sales. Instead, Kodak adopted a restrictive sales policy, an act that would be expected to devastate either Kodak’s equipment sales or Kodak’s faith in its theory. Yet, it has done neither. Service prices have risen for Kodak customers, but there is no evidence or assertion that Kodak equipment sales have dropped.”

To explain this symptom, Justice Blackmun has relied on two concepts: information cost and switching costs. New customers (*youngsters*) have not been informed of the ‘lifecycle pricing’ when they bought Kodak products, and some customers are less informed than others. Once they have bought their Kodak copiers and become *oldsters*, they would not replace Kodak equipment to opt for a lower-priced service, because the switching costs would be too high. Hence, according the Judge “Kodak chose to gain immediate profits by exerting its market power where [information cost and switching costs] ... eliminated any long-term loss” (para. 40).

b. Consumer’s expenditure as indirect switching costs

The above opinion of Justice Blackmun has also pointed to another factor that accumulates switching costs: the consumers’ expenditure in relation to the incumbent’s product. An example can be taken from *IMS* (see section 2.3 above). Not only has IMS invested in developing the 1860 brick-structure, but many of IMS’s clients have also played a significant role in the development of this structure, through the “RPM Arbeitskreis” (Working Group, see Decision 2001/165 /EC: 74-166). As the consumers (oldsters) are the owners of the data, they should have the right to replace the database program with a new one. The consumers cannot reuse their data in the rival’s database if the latter is not compatible with IMS format (the 1860 brick structure). Another 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 them from switching from Microsoft networks to rival networks such as Linux (see Gartner Dataquest, in section 2.1).

As a consumer keeps generating new contents, switching costs grow up and affect his capacity to exit and buy a better product from the incumbent's rivals, as described in the Shubik's dollar auction game. 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 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 the strategy. This game shows that the longer the time, 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.²³

3. SWITCHING COSTS AND THE INTEROPERABILITY QUESTION

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, their users eventually will have to switch to either Linux or NT. Most servers, regardless of their OS, support PCs that run Windows as 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. Another option -- switch to Linux at both levels, server and desktop, is infeasible because switching costs will be too high (see e.g., Gartner Dataquest, 2003).

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 compatibility problem, then this compatibility has created a force equivalent to parameter S in Figure 3

²³ Poundstone (1992) *Prisoner's Dilemma – John Von Neumann, Game Theory and the Puzzle of the Bomb*. Oxford Clarendon, p. 261.

above. In this Figure, we can denote U_1 as the utility surplus between NT and UNIX, without taking into account factors stemming from the system compatibility. U_2 represents the utility surplus between Linux and UNIX. From Formula (1) [$S > \Delta U$], we can conclude that the higher the incompatibility between the 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. By raising S , Microsoft has created a gap $\Delta U = S$ that it can exploit.

The statistics 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.²⁴ However, the consumers who need server OSs primarily for sharing files and printing would switch from UNIX to NT rather than Linux. The reason is not because of the inferior quality of Linux, or because of the high price that Linux engineers charge users, but because of the incompatibility between the desktop OS (Windows) and the server OS. ZDNet (2001) reports that Amazon.com has saved \$15 million upon switching from UNIX to Linux. IDC (2003) and InfoWorld (2003), through a survey with 1000 network management experts at C-level executives, also confirms that Linux is superior to NT in terms of scientific engineering, security, and web serving. However, they 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. The more the applications, the higher the switching costs (Gartner Dataquest, 2003; Microsoft Europe: 516). This situation proves the equation stated in section 2.3: *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. They have suffered detriment not because Linux does not provide a better performance than NT, but because they have bought Windows and other Microsoft applications, which are run against them in the server OS market, in the same way as the purchase of copiers run against the copiers users in the

²⁴ See World Street Journal (*WSJ*) *Europe* 5 Apr. 2004: A1.

service market in *Kodak*. Like *Kodak*, the solution for the incompatibility problem would be to order Microsoft to grant necessary APIs licenses to Linux server OS providers. The license is necessary not because otherwise Linux server OS providers cannot compete with NT, not because of innovation stimulation. The license is necessary because otherwise Microsoft's customers will suffer detriment because instead of buying NT, they have opted to a more secured and lower-priced service OS, Linux. Their disutility, such as inconvenience in login, file sharing and printing synchronisation are not due to the inferior technology of Linux, but solely to Microsoft's tactic.

A requirement of seamless interaction between Linux and Microsoft's desktop programs is a legitimate requirement not only for the service OS providers, but also for the Microsoft customers; similar to the requirements of the equipment purchasers in *Kodak* and *Hugin v Commission* [1979] ECR 1869 to have a right to choose their after-sale service providers (see e.g., *Hugin*: para. 6). In the end, Linux OSs, although better than NT in terms of security, cannot serve Microsoft's customers in the desktop's market to the extent that Microsoft customers would expect.

Can we make an analogy between *Microsoft Europe* and *Kodak/Hugin* by treating the server OS market in the same manner as the service market? In the context of Linux, the answer would be yes. The business model of Linux or any software based on GNU General Public License (GPL) is on roughly 30 percent of software and hardware acquisition, but 70 percent of maintenance and services. The business of Linux developers, as well as the open source software developers, is based on the 'after-sale' services. If we look at Microsoft's consumers at the desktop level, the rules of *Kodak* in the US and of *Hugin* in EU can be applied to the interoperability question. Like the consumers in the cited cases, they have been locked-in in a market with high switching costs, and the incompatibility has exploited the rent from these costs. We have defined in section 2.1 above that detriment is a loss of utility surplus, hence the loss of functions that otherwise would have been avoided by an interface license will be considered as a detriment to consumers. 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

not only for rising switching costs but also for any abusive practices, including price increase.

4. SWITCHING COSTS AND THE BUNDLING QUESTION

With respect to bundling, we need to accept that it is a useful practice, even if such a practice is a ‘bundling by default’. The consumers’ demand for bundling does exist, and bundling helps reducing transaction costs for the consumers. Without bundling, they would have spent time and money to search and buy the appropriate media players. 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 will look into the following issues: (1) what are the economic objectives of bundling for firms, and (2) whether these objectives necessarily give rise to consumer detriment.

4.1 WHY BUNDLING?

Although bundling may arguably bring benefits to the consumers, it seems hard for conventional thinking to reason why software developers are willing to give away software. The Commission decision in Microsoft Europe even revealed that RealNetworks have tipped the original equipment manufacturers (OEMs) or broadband developers to give away its software but in vain (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 avoided answering this question. Microsoft emphasizes several times that bundling is good for the consumers, without explaining why bundling is good for its business. The Commission pointed out that Microsoft’s motivation in bundling is to eliminate competition, but it does not explain why RealNetworks or other software developers also want to bundle their products into Windows, knowing that they cannot eliminate the competition from Microsoft by this method.

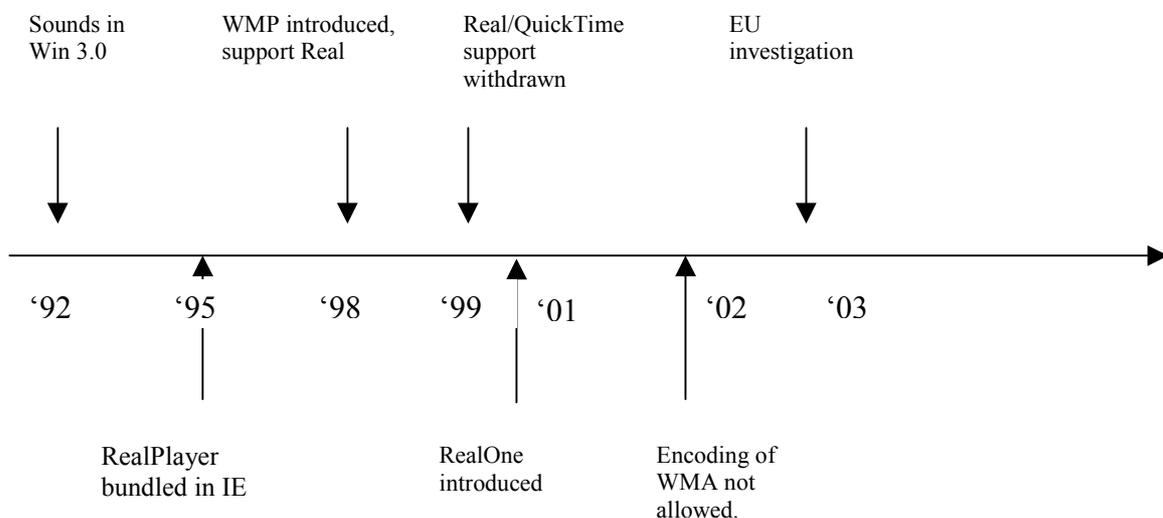
One way to explain bundling for Microsoft is to make Windows become more attractive vis-à-vis other desktop operating systems such as Linux or OS/2. By that logic however, we would be forced to conclude that Microsoft has overcharged its customers for Windows in the past (and now must bundle WMP in lieu of reducing prices), an assumption that we are not yet willing to make. If the above explanation could be accepted, then we cannot explain why Microsoft would not allow RealOne to be bundled into Windows, since RealOne will bring benefits to Windows in the same way as Microsoft does. 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 likewise ‘WMP is a part of Windows’ should be rejected.

Another explanation of bundling is not to bring 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).” This strategy is similar to Adobe. Adobe gives away Adobe Acrobat Reader, a program that can read PDF (portable document file) format in order to solicit customers in Adobe Acrobat Distiller, which can rip many types of documents formats into PDF files.

The motivation ‘bundling in order to solicit further investments in WMA and WMV’ aims at exploiting the vertical and horizontal network effects surrounding WMP. This strategy in itself is nothing unusual or anticompetitive. Not only Microsoft but also other firms also think of exploiting network effects by bundling. But even this does not explain why Microsoft would not allow RealNetworks to be bundled by default into Windows, since RealNetworks also support WMA and WMV formats and codec. There must be an additional motivation Microsoft tactic of bundling that make it reject the Decision’s request

to provide a version of Windows stripped-off WMP so that RealNetworks or other media players can be bundled into it.

The Microsoft's additional motivation, which is put across in this article, is the accumulation of switching costs following the formula in section 2.3: *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 NetShow Player (1998) of Microsoft supported RealAudio, RealVideo and QuickTime formats. In August 1999 however, Microsoft released the Windows Media Technologies 4 architecture and no longer supported RealNetworks or QuickTime's formats. From this time on, Microsoft constantly added on extra functions, including Media Format, Media Rights Manager, Media Encoder and Media SDK. Later, WMP 8 no longer provide for native MP3 ripping support (para. 313). RealOne has always supported WMA formats, whereas QuickTime has not (pars. 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 codec, pushing away the formats and codec of rivals, even in the original format MP3. 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 WMP with another formats.

The methods that switching costs have been accumulated in the media market are very similar to the method that switching costs have been accumulated in the market for desktop OSs and server OSs. As shown in section 2.3, raising switching costs is a method to exploit the consumers, if by so doing the consumers have to choose a sub-optimal product.

4.2 DETRIMENT TO CONSUMERS FROM BUNDLING

a. Detriment to consumers when WMP is not the best product in the market

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.²⁵ 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 nine times by PC Magazine and InfoWord, whereas WMP has been voted only twice. Thus, at least for a considerable number of consumers, the choice of WMP is a sub-optimal one ($U_{WMP} < U_{Real}$). If the consumers are forced to choose WMP, they are suffering consumer detriment.

²⁵ 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>>.

If RealOne is better than WMP, Microsoft argued, the 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 (Release: 6). The argument on ‘free download’, 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. If ‘free download’ were a solution, then in the browser market many PC users would have downloaded and used Netscape, Mozilla or Opera as the default browsers. Please note that in 2003 Opera has been awarded by InfoWorld and IDC as the most security-robust and best-performed browser, on top of Internet Explorer (see <http://www.opera.com>). The reality is, in spite of the 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. As Justice Blackmun pointed out in *Kodak* (at para. 35), “the sophisticated [customers] will be unable to prevent the exploitation of the uninformed.”

The number of download software is meaningless. A piece of software can be downloaded any time its old version is online (through screen prompt, Microsoft Decision: 865). Moreover, downloading a program does not mean that such a program will be used (Microsoft Decision: 920). In any PC, as long as WMP is not deleted, it will run as the default media player (the first player to be used in line); unless the users change configuration, a task that not all PC users know how to do.

It is important to note that the number of download software is also meaningless because by the end of the day the PC users are not the one who will decide what media players will be used. The media player is only useful if it supports the formats and codec pre-defined by the media content providers. In other words, the choice of codec 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 codec, 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. This fact has been highlighted in Microsoft Decision, paras. 884-887.

Please note that WMP has been installed by the default since 1999 into Windows 98SE. As PCs are normally replaced every three to five years, most of PCs nowadays have been produced *after* 1999. Given that all OEMs who install Windows into their PCs must take WMP, this mean almost all PCs would have WMP installed if they use Windows 98SE upward. 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 old versions such as Windows 95. One can say that all Windows-installed PCs nowadays have WMP in them. Given this fact, the choice of the content media players is simple: they will support WMP, and perhaps iTune (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 supports 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.²⁶ 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 denote $g(x)$ as the choice of the OEMs, $f(x)$ as the choice of the PC users, $h(x)$ is the choice of the media content providers. L is the choice of WMP. If the choices of both the OEMs and the media content providers are converged WMP, then the choice of the PC users will be so converted, regardless of whether they have downloaded other media players in the past.

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. The ubiquity of WMP is gained because the OEMs have no choice when Microsoft holds market power in Windows, and bundles WMP into Windows. The PC users and the content providers have therefore suffered detriment. In the long-term, such detriment will exacerbate, as the amount of media contents formatted by Microsoft's codec increase, raising switching costs in favour of Microsoft's products.

Please note that the bundling of WMP is only one of the examples of the practices that Microsoft has taken. In addition to WMP, Microsoft also intends to bundle its Instant Messenger Service and Outlook Express e-mail program, Movie Maker video editing software, as well as a search engine, which would compete with Google into Windows XP.²⁷ If look at the past, bundling has been applied to the browser market (Internet Explorer) and the office software package (Microsoft Office).

²⁶ See Weinstein, D. (1999) Pinching theorem, in <http://mathworld.wolfram.com/PinchingTheorem.html>.

²⁷ Meller, P. "Chances of Microsoft Accord in Europe Dim" *NY Times* 18 Mar. 2004; and Dombey, D. "Microsoft deal rejected over Windows worries" *Financial Times* 21 Mar. 2004.

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. 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 has performed the service at a loss in order to protect the reputation in quality and services (para. 13). In other words, Hugin's service is optimal to the consumers.²⁸

If WMP were better than RealOne, Microsoft would have argued that WMP have gained consumers anyway without bundling it into Windows. However, if that is the case, why should Microsoft use the bundling practice, except for the sole reason to eliminate all competition in the downstream market, so that in the future even a better product would not arise? Both EU law and US law have repeatedly considered leverage of market power with intention to eliminate competitors as anticompetitive (see e.g., *IMS*, C-418/01, para. 47). This principle has been repeated in many cases, most notably *Tetra Pak II* (para. 41) and *Kodak* (para. 1).²⁹

In addition, 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

²⁸ Please note that Hugin did not hold a dominant position in the market for equipment (similar to *Kodak*). If it holds dominant position or even monopoly power (similar to *Microsoft Europe*), Hugin would have been subject to more severe scrutiny.

²⁹ As this section focuses on consumer detriment, the 'intention to monopolise' test is not elaborated. This test is also referred to as 'no economic sense' test, using Justice Scalia's terminology in *Verizon*: "[a conduct would be anticompetitive] if it would make no economic sense for [the dominant firm] but for the tendency to eliminate or lessen competition." (see Werden, 2004: 13).

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 occurs because it could 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). 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 still has 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 songs (*NY Times* 29 Apr. 2004). Should RealNetworks and Apple withdraw from the media players' market due to Microsoft's bundling tactic, these subscribers would have to convert or rip their songs they have purchased into Windows formats, incurring extra switching costs.

Moreover, RealOne is installed in more than seven million mobile phones worldwide (Zelos Group and Envisioneering; see Lohr, 2004). Consequently, music and pictures stored in mobile phones may have adopted RealNetworks' formats and codecs (.ra and .rv), whereas music and pictures stored in PCs adopt WMA and WMV. This inconvenience prevents PC users to download music from their PCs to mobile phones. If WMA and WMV prevail in the PC market, they will likely prevail in the mobile phone market, incurring further switching costs of the mobile phone users. They must convert their files and replace media players.³⁰

³⁰ Yosida, K. "EC's Microsoft ruling set precedents for other industries" *EE Times* 25 March 2004.

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 in short of funds for further innovation.³¹ 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.³² Fischer and Rubinfeld (2001: 57) demonstrate that the failure of Netscape is a credible threat to other innovators. That is, although Microsoft is not the first mover, it is always the standard setter, thanks to the bundling practice.³³ This threat will paralyse any incentive that governments or consumers try to provide innovators.

³¹ RealNetworks reported that it has lost US\$245 million in four years since 1998 (see e.g., Lohr, 2004).

³² Shapiro and Varian (1999). The failure of many operating systems, such as O/S 2 or Solaris to compete with Microsoft Windows, and the difficulties the Linux PC operating system experienced when competing with Windows, have shown that the entrants could not attract the consumers notwithstanding their innovation. Creuss and Agustinoy (2000: 71) call Windows the 'nervous system' of PC as its denial to command would give any part of the body useless.

³³ Andrew (1999: 327), Binkley and Lohr (1999) observe that before the bundling, the forerunner in web browser market, Netscape, had captured 90 percent of the market. One year after bundling IE into Windows, Netscape had captured only 40 percent of the market. By now almost all PCs ran on Windows use IE as the default web browser. In theory, it is possible to download and install two browsers on a PC. However, in practice, users are reluctant to install a new browser if what they already have one.

We have argued that in the software sector, bundling by a dominant firm will deprive the consumer's freedom of choice. However, will less choice itself be a detriment to consumers? There is no clear answer; but in terms of probability, more choices rather than fewer choices will lead to more opportunities to innovate.³⁴ As argued in section 4.1.3, without competition, the monopolist would not have strong incentive to innovate.

Concerning the detriment of the consumers, 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 has 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 have benefited immediately and innovation has flourished. As for AT&T, its tariffs had decreased by 40 to 45 percent in 1980s, but its volume had increased 6.7 percent annually. Had the spin-off been delayed, consumers would have suffered more.³⁵ A competitive market can only lead to less innovation if the risks of sunk costs and free riding are too high. Bundling is not this case. If the incumbent were concerned about sunk costs, it would not give the bundled product for free.

CONCLUSION

This research has used the concept of switching costs to show detriment to consumers in *Microsoft Europe*, as an additional argument to support the Commission Decision. It counters directly Microsoft's main arguments, which state that their practices in both the interoperability issue and the bundling issue are beneficiary to the consumers, albeit they

³⁴ 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.

³⁵ FCC, *Statistics of Communications Common Carriers*, Washington DC 1991.

may harm competitors. In a nutshell, both issues represent the very principle in *Tetra Pak II*, that conduct of a firm holding monopoly power in one market may affect another market where it does not hold a dominant position, if there is an ‘associated link’ between one market and the other. In both issues, anticompetitive is taken from one market only – the market for desktop OSs.

1. With respect to the interoperability issue, Microsoft has prejudiced its own customers, who bought desktop Windows, by being denied the functions that their product does provide, simply because they have chosen a different rival server OS. Switching costs are relevant in the analysis in that by creating incompatibility between desktop Windows and rival server OSs, Microsoft has raised relative switching costs for *its* customers, who want to choose Linux instead of NT as the ‘service provider’. This situation is also analogous to the cases *Hugin* and *Kodak*.
2. With respect to the bundling issue, by controlling the OEMs, Microsoft has leveraged the market power from the market for desktop OSs to the market for media players and content media. Consequently, consumer choice in this downstream market has been sub-optimal, presenting consumer detriment. Even when WMP is the best product in the market, the refusal to support rival products has resulted in detriment to the users of contents stored in the rival formats.

<i>Downstream market for media player</i>	WMP, iTune and Real One.	Incompatibility among media contents stored in different formats and codec.
<i>Market for desktop OS</i>	<u>Microsoft Windows (more than 95% of the market).</u>	Applications and contents formulated in a pre-defined APIs.
<i>Upstream market for server OS</i>	NT, Sun Solaris, IBM, Novell, Apache, Linux.	Incompatibility between Linux/UNIX and Windows desktop OS.

Table 1: the Microsoft investigation in Europe

In light of the above, the solution imposed by the Commission is appropriate. It does not require Microsoft to totally unbundle WMP from Windows, and therefore consumers still enjoy the benefits of bundling. However, by opening markets for the products that provide system compatibility such as RealOne, the Commission has reduced the detriments that switching costs can cause to the consumers. By liberating the OEMs from the control of Microsoft, the Commission has created a spillover effect to the content providers and ultimately the PC users. It will also satisfy the legitimate demand of the consumers who would have suffered detriment from switching costs otherwise.