



**ROBERTO PARDOLESI AND ANDREA RENDA**

**THE EUROPEAN COMMISSION'S CASE AGAINST  
MICROSOFT: FOOL MONTI KILLS BILL?**

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# THE EUROPEAN COMMISSION'S CASE AGAINST MICROSOFT: FOOL MONTI KILLS BILL?

*Roberto Pardolesi and Andrea Renda*

## ABSTRACT

*The recent decision issued by the European Commission against Microsoft raises legitimate concerns under many respects. First, the way the Commission handled the whole proceeding highlighted all the impasse that characterizes antitrust authorities when dealing with complex cases from the high-tech world. Secondly, the Commission's decision adopted a mistaken approach to interoperability, confusing it with perfect emulation of Microsoft's copyrighted source code. Thirdly, the Commission showed little or no attention to the economics of technological leveraging in dealing with the media player market, and ended up awkwardly mimicking the rationale upheld by the US District Judge in the "browsers war". We conclude by calling for more sound economic analysis at the European Commission, and suggesting what possible solutions could have been endorsed, which would significantly improve the level-playing-field in the server software and in the media player markets, without hindering incentives to invest and consequently stifling innovation.*

## THE EUROPEAN COMMISSION'S CASE AGAINST MICROSOFT: FOOL MONTI KILLS BILL?

*Roberto Pardolesi\* and Andrea Renda\*\**

A few years ago, a commentator labeled the Microsoft case as “the case of the century”<sup>1</sup>. Funnily enough, that century is now over, a new one has begun, and the Microsoft saga is still here to stay. And the case’s latest developments suggest that the whole litigation will remain under the spotlight for at least another few years, until the European Court of Justice will decide whether to endorse the Commission’s recent decision to condemn Microsoft for having abused its dominant position in the market for PC client Operating Systems (hereinafter, OS) for the purpose of monopolizing adjacent markets and, more importantly, to preserve its applications barrier to entry in the tying market.

The Commission’s decision, published on April 27, 2004, deserves careful scrutiny.<sup>2</sup> On the one hand, the magnitude of the announced fine, as high as €497 million, leads Microsoft to beat yet another record in the history of competition policy on this side of the Atlantic. On the other hand, the Commission imposed extremely heavy obligations on the Redmond-based giant softwarehouse, although the original case brought by the Commission was subject to massive reshaping before Monti’s team could issue a final decision; and there are sufficient reasons to conclude that the final impact of the decision will grandly exceed the aim of restoring a level-playing field in the affected markets.

An exemplar punishment, many have noted. An unfair death sentence, others remarked. The current debate closely resembles that which occurred in the US at the end of 2001, when the Proposed Final Judgment signed by Microsoft, the US DoJ and nine of the eighteen plaintiff states was submitted for 60 days to public comments as required by the Tunney

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\* Director, LE Lab, and Full Professor of Comparative Law, Faculty of Economics, LUISS Guido Carli. Email comments at [rpardole@luiss.it](mailto:rpardole@luiss.it).

\*\* Senior Research Fellow, LE Lab, LUISS Guido Carli. Email comments at [arenda@luiss.it](mailto:arenda@luiss.it).

<sup>1</sup> See, *i.a.*, *Case of The Century?*, Newsweek, 16 November 1998.

<sup>2</sup> The text of the European Commission’s decision is available online at <http://europa.eu.int/comm/competition/antitrust/cases/decisions/37792/en.pdf> (last visited on August 19, 2004).

Act procedure.<sup>3</sup> There is, however, one important difference: the Commission's approach in the proceeding was fiercely criticized by the US competition authorities, which implicitly accused EU trustbusters to have largely abused their paramount position as consumer welfare watchdogs.<sup>4</sup>

In our opinion, the US authorities are fundamentally right in their criticisms. The Commission's approach in the Microsoft case appears deeply flawed, and in more than one respect. As a matter of fact, the Commission seems to have handled the case with increasing clumsiness, exhibiting a glamorous lack of acquaintance with the peculiar economics of high-tech industries. And the bugs in the Commission's approach become even more worrying since the Microsoft case, as one of us already noted in a recent article, ended up becoming a *synecdoche*, a part for the whole, a settlement of private interests which will inevitably affect the whole future of high-tech industries.<sup>5</sup> In this respect, we believe that the Commission has succeeded in the arduous task of achieving a *Pareto-pessimum*, devising an undesirable solution both for the plaintiffs and the defendant and highlighting, once again, that the borders of competition policy and industry regulation are still largely nebulous in Brussels.

The remaining part of this paper is structured as follows. Section 1 briefly sketches the main features of the US and EU cases, identifies the key differences between the two proceedings and considers whether the

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<sup>3</sup> The Tunney Act requires the Court to subject any consent decree proposed in any civil proceeding brought by the United States under the antitrust laws to a determination of whether entry of such decree is in the "public interest." 15 U.S.C. § 16(b),(e); The 60-day public consultation mandated by the Tunney Act procedure for pre-trial settlements elicited an impressive number of comments – as many as 32,000 – in the US v. Microsoft case. Consider that the first consent decree signed between Microsoft and the DoJ, signed in 1994 and entered by Judge Penfield Jackson (U.S. v. Microsoft Corp., 159 F.R.D. 318 (D.D.C.), *rev'd*, 56 F.3d 1448 (D.C. Cir. 1995) had received only five comments. Even the proposed final judgment of the famous AT&T case, which marked a new epoch in the US telecommunication sector, generated in 1982 'only' six hundred comments. (See U.S. v. AT&T, 552 F. Supp. 131, 135 (D.D.C. 1982). The comments filed during the 60-day consultation are available at <http://www.usdoj.gov/atr/cases/ms-comment.htm>. (last visited on August 19, 2004). For a critical appraisal, see A. Renda, *Catch Me if You Can! The Microsoft Saga and the Sorrows of Old Antitrust*, Erasmus Law and Economics Review, 1/2004, available at <http://www.eler.org/archive/issue1/eler-2004-1-1-renda.pdf> (last visited on August 19, 2004).

<sup>4</sup> See, e.g. John Oates, *US DoJ Condemns MS Ruling*, The Register, 25 March 2004, available online at [http://www.theregister.co.uk/2004/03/25/us\\_doj\\_condemns\\_ms\\_ruling/](http://www.theregister.co.uk/2004/03/25/us_doj_condemns_ms_ruling/). (last visited on August 19, 2004) According to a growing number of commentators, the EU decision might also lead to future conflicts between the US and EU authorities. And this is confirmed by the open letter to Commissioner Monti recently drafted by 10 members of the House of Representatives' International Relations committee.

<sup>5</sup> See A. Renda, *Catch Me if You Can!*, *supra* note 3.

different solution provided by competition authorities on the two sides of the Atlantic is consistent with the purpose of protecting competition and consumer welfare in the relevant markets. However, a thorough assessment of the different features of the two cases requires a careful analysis of the competitive dynamics of high-tech industries. For this reason, in Section 2 we provide a few hints for undertaking such analysis. In particular, we describe dynamic competition between system goods exhibiting different architectures as well as different degrees of openness, under peculiar market effects such as network externalities and learning effects. Section 3 analyzes more in detail the Commission's case, with specific emphasis on the issues of refusal to supply in the work group server OS market and technological integration in the streaming media player market. We find that the Commission adopted a rather awkward approach in dealing with both issues. Section 4 concludes, by highlighting that endorsing a solution in line with the wording of the consent decree recently entered in the US would have contributed to restoring the level-playing field and a virtuous competitive environment in the software industry, without depressing incentives to invest in R&D.

## 1 TWO CASES, TWO SOLUTIONS

At first blush, the European Commission's case against Microsoft substantially differs from the famous case handled by the US Department of Justice in 1998, and settled in 2002 with entry of the consent decree by District Judge Kollar Kotelly.<sup>6</sup> Such difference, anyway, should not be overstated. Undoubtedly, the markets subject to scrutiny, the alleged abusive conducts challenged in those markets and the remedies identified by competition authorities to address those conducts are different. Nevertheless, the latest developments in the EU have marked a significant deviation from the original case brought by the Commission, leading it to resemble way more closely the allegations and the approach adopted in the US. In what follows, we shortly summarize the main similarities and differences between the two cases.

### 1.1 THE "WEST SIDE STORY"

The US and EU proceedings share a common starting point: Microsoft holds a dominant position in the market for PC client OS, and abused such position over the past few years by trying to preserve high barriers to entry

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<sup>6</sup> For a more detailed description of the US case, see A. Renda, *Catch Me if You Can!*, *supra* note 3.

in the relevant market.<sup>7</sup> The two proceedings, however, deployed in quite different directions from this same core statement. In the US, the District Court found Microsoft to have successfully leveraged such dominant position into the adjacent market for Internet browsing software.<sup>8</sup> By doing this, Microsoft was attempting to preserve the applications barrier to entry that protected its paramount position in the tying market, by ensuring that Netscape Navigator and Sun’s Java-based platform did not take over Windows’ central role in the PC system. The District Court found that Microsoft could profitably exercise such leveraging, on the one hand, by technologically integrating Windows with the browser Internet Explorer and, on the other, by contractually forcing OEMs not to market or otherwise promote competing browsers or other undesired application software.<sup>9</sup>

For what concerns technological integration, the US proceeding elicited a fierce debate, eventually leading to significant amendments both in the economic analysis of high-tech markets and in the legal approach to technological tying. Initially, District Judge Thomas Penfield Jackson stated that Microsoft had illegally tied the sale of its Internet browser to that of its operating system Windows, which represented a *de facto* industry standard and, as such, granted Microsoft unmatched ubiquity on end users’ desktops.<sup>10</sup>

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<sup>7</sup> Incidentally, it is worth recalling that the US and EU competition authorities defined the relevant market quite differently. According to the US DoJ, Microsoft is dominant in the supply of Operating Systems for Intel-compatible Personal Computers – a market which excludes Apple’s MacOS, which was normally considered to be Windows’ fiercest rival. See Section II of Judge Jackson’s Findings of Fact, available at <http://www.usdoj.gov/atr/cases/f3800/msjudge.pdf> (last visited on August 19, 2004). To the contrary, the European Commission decided to leave the question of whether to include non-Intel compatible PC client Operating systems in the relevant market open, since “the difference will not be such as to alter the result of the assessment of Microsoft’s market power”. See the Commission’s decision, *supra* note 2, at §326.

<sup>8</sup> The District Court Judge Penfield Jackson’s Findings of fact contain data on the change in Explorer and Navigator’s usage share. See Findings of Fact, *supra* note 7, at §§359-376.

<sup>9</sup> See Findings of Fact, *supra* note 7, at §170, and the detailed analysis of Microsoft’s code commingling provided by the Court of Appeals. See <http://ecfp.cadc.uscourts.gov/MS-Docs/1720/0.pdf>, Section B.2, at 36 (last visited on August 19, 2004). On Microsoft’s contractual relationships with OEMs, IAPs and ISVs, see the Findings of Fact at §§202-238, 242-310 and 311-340; see also the decision issued by the Court of Appeals, at Section B.1, B.3 and B.4.

<sup>10</sup> It is worth recalling that Microsoft began commingling the code of Windows 98 and Internet Explorer for reasons that might also be related to the alternate fortunes of its judicial saga. In *Microsoft II*, the Redmond-based softwarehouse was condemned for unlawful bundling of Internet Explorer with Windows 95, and signed a consent decree in which it committed to unbundle the sale of the two products. However, the consent decree specified that Microsoft could still choose to design integrated products, a choice which was considered not to infringe the

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Following these findings, Judge Jackson proposed that Microsoft be split into two separate “baby bills”, along the lines of the renown Supreme Court’s *AT&T* decision.<sup>11</sup> The Court of Appeals later rejected Jackson’s rationale by stating that technological integration should be subject to a rule of reason approach, rather than to the *per se* rule normally applied to tying claims.<sup>12</sup> A conclusion which was backed by the economic analysis of efficiencies spurring from end-user demand for integrated products, such as reduced transaction costs and added value from integration. For this reason, Microsoft was not ordered to remove the technological integration, nor was forced to market a stripped-down version of Windows with no browsing functionalities, as had been requested by the nine dissenting states in their alternative remedial proposal.<sup>13</sup>

On the contrary, as regards Microsoft’s contractual behaviour, the Court of Appeals upheld Judge Jackson’s finding that Microsoft had abused its paramount position in the market for Intel-compatible PC Operating Systems by inducing original equipment manufacturers, independent software vendors and other industry players not to market, advertise or otherwise promote rival application software, such as the browser Netscape Navigator.<sup>14</sup> Accordingly, the consent decree signed by Microsoft and the DoJ contains a number of remedies addressing this problem. In particular, Microsoft was obliged to disclose at reasonable and non-discriminatory (RAND) conditions the interface information needed by application software developers in order to achieve interoperability with

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wording of the decree. See the Final Judgment entering the 1995 consent decree, available at <http://www.usdoj.gov/atr/cases/f0000/0047.htm>. (last visited on August 19, 2004).

<sup>11</sup> See *U.S. v. AT&T*, 552 F. Supp. 131, 135 (D.D.C. 1982)

<sup>12</sup> See Court of Appeals, *supra* note 9, Section IV.B, at 77. This solution marked a Copernican revolution in the antitrust treatment of tying, by endorsing a rule of reason approach as opposed to the mainstream *per se* approach specified in *Jefferson Parish*. See Christian Ahlborn, David S. Evans & A. Jorge Padilla, *The Antitrust Economics of Tying: a Farewell to Per Se Illegality?*, AEI-Brookings Working Paper 03-3, February 2003. For a more detailed analysis of the deferential approach adopted by US courts towards integrated product design, see *infra*, note 144.

<sup>13</sup> Again, for a detailed description of the alternative remedial proposal, see A. Renda, *Catch me if you can!*, *supra* note 3. The text of the alternative proposal is available at <http://cyber.law.harvard.edu/msdoj/states-remedy.pdf> (last visited on August 19, 2004). The dissenting States are California, Connecticut, Florida, Iowa, Kansas, Massachusetts, Minnesota, Utah, Virginia and D.C. The text of the proposed final judgment is available at <http://cyber.law.harvard.edu/msdoj/states-fj.pdf> (last visited on August 17, 2004).

<sup>14</sup> The Court of Appeals rejected Jackson’s rationale as regards technological tying, and disqualified the District Court judge for judicial misconduct and appearance of partiality in dealing with the Redmond-based softwarehouse. See Court of Appeals, *supra* note 9, Section VI, at 106.



the Windows platform.<sup>15</sup> Moreover, Microsoft committed to disclose information on the protocols used by Windows to communicate with server operating systems, thus allowing for client-to-server interoperability (i.e., communication of non-Windows servers with Windows clients).<sup>16</sup>

In summary, in the US Microsoft committed to refrain from discriminating between contractual counterparties depending on their choice to promote competing software products. Microsoft committed to publish the standard license conditions for Windows in order to document its compliance with the requirement of non-discrimination.<sup>17</sup> But Microsoft was not ordered to re-design its operating system and remove browsing functionalities, nor was obliged to license its Windows interfaces to rivals or to any other operator whose purpose was different from that of interoperating with the Windows platform.

The consent decree also provided for a compliance monitoring mechanism, which implied the filing of a Status Report to the District Court every six months. Since then, four interim Status Reports were filed, highlighting that Microsoft had only partially complied with the prescriptions contained in the decree.<sup>18</sup> In particular, Microsoft is reported to have succeeded in disclosing interface information to application software developers, therefore allowing for OS-to-applications interoperability at RAND conditions. However, the Court expressed some concerns on the way Microsoft has so far implemented its licensing of Communication Protocols for client-to-server interoperability. Pursuant to the November 6, 2001 Stipulation, a Microsoft Communication Protocols Programme (MCP) was launched on August 2002. However, the MCP had led to as few as four new licenses when the first Interim Status Report was filed, on July 3, 2003. The District Court Judge expressed its concerns on the incomplete implementation of Section III.E of the consent decree, which is considered to be “the most forward-looking provision in the Court’s remedy” with the objective of “unfettering the market and restoring competition”.<sup>19</sup>

After the first Interim Status Report, Microsoft has conducted extensive negotiations with the Plaintiffs and many other stakeholders, gradually

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<sup>15</sup> See the Final Decree entered by the District Court, available at [www.microsoft-antitrust.gov/pdf/Nov0102MSFinalJudgment.pdf](http://www.microsoft-antitrust.gov/pdf/Nov0102MSFinalJudgment.pdf), Section III.D (last visited on August 19, 2004).

<sup>16</sup> *Id.*, at III.E.

<sup>17</sup> *Id.*, at III.B.

<sup>18</sup> The text of the Status Reports are available online at [http://www.usdoj.gov/atr/cases/ms\\_index.htm](http://www.usdoj.gov/atr/cases/ms_index.htm) (last visited on August 19, 2004).

<sup>19</sup> *New York v. Microsoft*, 224 F. Supp. 2d 76, 226 (D.D.C. 2002) .

improving its standard license terms. Microsoft also published a “reference agreement”, which contains technical information on how interfaces are implemented by Microsoft.<sup>20</sup> But when the second Status Report was filed, on October 23, 2003, only four new licensees had joined the MCPP, mostly for use in file and print servers.<sup>21</sup> As of July, 2004, the number of firms that have successfully joined Microsoft’s MCPP has climbed to seventeen.

There are many reasonable explanations for the limited implementation of the MCPP. One possible reason is that client-to-server interoperability lied at the core of the EU case. Would-be licensees might thus have adopted a “wait-and-see” tactic before undertaking negotiations with Microsoft, since a favourable solution in the EU case could have provided them with better license conditions. And this is exactly what happened, as we will explain in the next sections.

## 1.2 THE EU CASE

Moving from the same finding – Microsoft’s dominant position in the PC client OS market – the Commission concluded that Microsoft leveraged such position into the market for “work group server” operating systems.<sup>22</sup> The major means used by Microsoft for implementing such leveraging strategy was non-disclosure of relevant interface information needed by rivals for the purpose of achieving full client-to-server as well as server-to-server interoperability.<sup>23</sup> According to the European Commission, such refusal to supply interface information ended up consolidating Microsoft’s paramount position in the market for client PC operating systems and (at least indirectly) harming consumers.<sup>24</sup> Information that Microsoft failed to disclose included a full specification of its Windows 2000 directory system, Active Directory, Microsoft’s implementation of the Kerberos protocol for

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<sup>20</sup> The debate over the allegedly limited scope of the reference agreement published by Microsoft concerned one of the key issues tackled by the European Commission in the EU Microsoft case. The Plaintiffs complained that “[t]hese licenses will not, however, allow the licensee to use the technical documentation to implement any of the CPs in a product ... in all events, because the license embodied in the Reference Agreement is limited, Plaintiffs do not consider industry response to the Reference Agreement to be a useful metric for evaluating the success of the MCPP Program.” In other words, the Plaintiffs consider the disclosure of the interface “specifications” to represent an insufficient measure, and aim at obtaining disclosure of Microsoft’s “implementation” of such interface information. See *infra*, Section 3.1.4.

<sup>21</sup> See the Second Interim Status Report, *supra* note 18, at 4.

<sup>22</sup> For a more detailed analysis of the Commission’s market definition exercise in Microsoft, see *infra*, section 3.1.1.

<sup>23</sup> See Commission’s decision, *supra* note 2, Sections 4.12-4.13, §§185-279.

<sup>24</sup> *Id.*, Section 5.3.1.3.1, §701.

authentication over a local network, Microsoft's object model COM and DCOM and a number of other pieces of interface information.<sup>25</sup> According to the Commission, Microsoft also abused its dominant position by granting some of its contractual partners (e.g. Compaq) privileged conditions, which other partners (namely, Sun Microsystems) were expressly denied.<sup>26</sup>

The Commission's allegations did not end up here. Another branch of the case, more similar to the "browser war", concerned Microsoft's technological integration of Windows with its media player software, Windows Media Player (WMP). This allegation was "bundled" with the aforementioned one during the proceeding.<sup>27</sup> According to the Commission, Microsoft illegally attempted to monopolize the media player market by forcing OEMs to pre-install Windows Media Player on their home computers. For this purpose, Microsoft willingly "commingled" the source code of Windows and WMP in order to pre-assemble a full-fledged operating system with media streaming functionalities and prevent OEMs from removing WMP from their PCs. This strategy allegedly granted WMP unmatched ubiquity on end-users' desktops. Since, according to the Commission, end users (especially non-techies) have scant incentives to switch to competing products once they find one media player software preinstalled on their computers, and since the market is characterized by direct and indirect network effects that lead it to tip towards the emergence of a single standard media player (WMP), the Commission concluded that Microsoft's conduct seriously jeopardized the persistence of a sufficient degree of competition in the relevant market, leading to an imminent foreclosure of rivals such as Real Networks and Apple.<sup>28</sup>

The Commission also provided a clear definition of the final effect produced by Microsoft's anticompetitive behaviour in the relevant markets.

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<sup>25</sup> *Id.*, §§208-279.

<sup>26</sup> The agreement between Microsoft and Compaq was aimed at improving interoperability between Microsoft Windows server and Compaq's Tru64 UNIX server OS, a high-end server that was not included in the relevant product market. Such an agreement was justified by the need to "better serve enterprises that are running a mixed operating system environment that includes both Windows 2000 Server and Compaq's Tru64 UNIX operating system". See the Commission's decision, *supra* note 2, at §§231-235. On Microsoft's alleged refusal to supply information to Sun, see *id.*, §§185-207.

<sup>27</sup> EC Commissioner Mario Monti integrated the two proceedings, in order to find out whether Microsoft reiteratedly abused its market power by attempting to monopolize more than one market, and thus considering Microsoft's conducts in the workgroup server OS and in the streaming media player markets as parts of a single monopolization strategy.

<sup>28</sup> *Id.*, §§835-878.

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Both conducts were found to be stifling competition and technological innovation in the tied markets, indirectly harming consumers.<sup>29</sup> For this reason, the EC decided to impose quite heavy obligations on the Redmond-based giant, forcing Microsoft, *i.a.*, to disclose relevant interface information at RAND conditions and to market a stripped-down version of Windows deprived of its WMP source code.

Although the Commission's rationale in challenging Microsoft's conduct might seem sufficiently linear, it is worth recalling that the Commission's case was subject to a "head-to-toe" change over the proceeding's five-year lifetime. As we will explain in further detail in Section 3, the main changes occurred in the Commission's case are the following:

- Initially, the Commission alleged that Microsoft had leveraged its monopoly position in the market for Personal Productivity Applications (PPAs) for the purpose of achieving a dominant position in the market for entry-level server OS. No reference to PPAs is left in the final decision.<sup>30</sup>
- The Commission originally defined the relevant market as the market for all entry-level server OS, defined as all OS installed on servers costing less than USD 100,000. In the final decision, this threshold was lowered to USD 25,000. Furthermore, the Commission switched to a task-based market definition.<sup>31</sup>
- In the first and second Statements of Objection, the Commission specified that "full interoperability" should be interpreted as not being limited to the specification of Microsoft's Application Programming Interfaces ("APIs"), and included Microsoft's proprietary implementation of such APIs. Later on, the Commission clarified that "full interoperability" does not cover Microsoft's specific implementation of given communication protocols.<sup>32</sup>

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<sup>29</sup> *Id.*, Section 5.3.1.3.1, §701.

<sup>30</sup> The reference to PPAs is contained both in the Statement of Objections in *Sun Microsystems v. Microsoft Corporation*, Case No. IV/C3/37.345, 1 August 2000 ("First SO"), §250; and in the Supplemental Statement of Objections, Filed Against Microsoft Corporation, Case No. Comp/C-3/37.792, 29 August 2001 ("Second SO"), at §150.

<sup>31</sup> Compare the First SO, at §237; the Second SO, at §104, and the Final Decision, at §§482-489.

<sup>32</sup> See, *e.g.*, the First SO at §347, the Second SO at footnote 230 and the Final decision at §999, where the Commission specifies that "[t]he use of the term "specifications" makes clear that Microsoft should not be required to disclose its own implementation of these specifications, that is to say, its own source code".

All three changes had the effect of substantially reducing the alleged impact of Microsoft's conduct on innovation and competition. Nevertheless, the Commission decided to impose Microsoft a huge fine – as high as 497 million Euros – and quite heavy undertakings.

### 1.3 FACE-OFF

As we just explained, the US and EU cases, although originated from the same finding (Microsoft's paramount position in the market for client PC operating systems), were handled and ended quite differently. In the US, as we already mentioned, the case was solved with the entry of a consent decree signed by Microsoft, the DoJ and nine of the originally eighteen plaintiff states. The Final Order contained only behavioural/contractual remedies, aimed at ensuring that Microsoft could not discriminate between upstream or downstream market players, and made available to all interested parties the interface information needed in order to effectively market products interoperable with the Windows platform.

On the other hand, the EU solution contains much more than mere behavioural measures. Microsoft is now forced to re-design its Windows operating system in order to eliminate the code-commingling with the media player, thus removing such added functionality from Windows' source code.<sup>33</sup> Moreover, Microsoft shall open up interface information contained in its server OS, which is a different product from the client Windows OS that was found to represent an industry *de facto* standard and the real source of market power for the Redmond-based company. Such interface information shall be disclosed to rivals in the server market, for the purpose of interoperating both with Microsoft's work group server OS and client OS. From this viewpoint, the European Commission's decision in the Microsoft case appears as providing a quasi-structural solution.

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<sup>33</sup> According to Brad Smith, Microsoft's General Counsel, "the code-removal approach that the commission pursued today is an approach that in our view will help a small number of competitors ... at the expense not only of our innovation but at the expense of consumers as well. And it's worth noting that the same competitors that have sought this outcome in Europe also sought it in the United States ... And the District Court ... rejected the precise code-removal remedy that the Commission has endorsed". See *News Teleconference with U.S.-based Journalists Regarding European Commission Decision*, available online at [www.microsoft.com/presspass/press/default.asp](http://www.microsoft.com/presspass/press/default.asp) (last visited on August 19, 2004). The disadvantages and costs related to re-designing part of Windows' source code were also prospected and detailed by Bill Gates during the latest developments of the US case. See Gates' testimony before the District Judge, 22 April 2002, available at <http://www.microsoft.com/presspass/trial/mswitness/2002/billgates/billgates.asp>, §§ 185-206 (last visited: August 17, 2004).

In summary, we observe two different cases and two different solutions. The most compelling questions now become the following: does the difference in the two cases justify the different solution devised? Is it correct to address the anticompetitive impact of Microsoft's alleged abuse of its dominant position in the client OS market by imposing disclosure of specifications contained in the work group server OS? Does economic theory support a solution that imposed the removal of technological integration between two different products? We anticipate that the answer to all these questions is no.

## 2 THE LAW AND ECONOMICS OF SYSTEM COMPETITION UNDER NETWORK EFFECTS

A peculiarity of software is that it is never used as a stand-alone product. And operating systems make no exception to this rule. Whether it is incorporated in a physical support (like a floppy disk, a CD or a DVD) or marketed as an entirely intangible good (e.g. downloaded from the Internet), all software produces utility for final users only when combined with other, complementary goods, just as a steering wheel needs all major components of a car in order to become useful for would-be drivers. Engineers normally refer to complementary goods in a system as "modules". Similarly, economists crafted for system components the term "complementor".<sup>34</sup> In the economic jargon, software must therefore be seen as part of a digital system good, composed by many complementors. This system good is normally a computing device, such as a personal computer, a workgroup server, a handheld device, a mobile phone, a game console etc.

Digital system goods exhibit highly peculiar competitive dynamics, which economists only recently started to acknowledge and analyze.<sup>35</sup> First, digital systems are modular: hence, depending on the proprietary features of each module, system architectures may vary substantially. Secondly, digital systems often compete under network effects, and this implies that different architectures might emerge as a result of market effects that call for involvement of more than one complementor producer within a single

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<sup>34</sup> See, *i.a.*, Carl Shapiro and Hal Varian, *Information rules*.

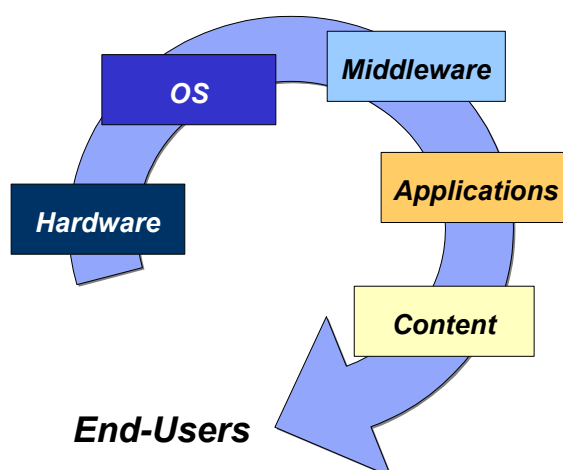
<sup>35</sup> See, e.g., M.J. Katz and Carl Shapiro, *Systems Competition and Network Effects*, 8 *Journal of Economic Perspectives*, 1994, 93. On modularity, see the brilliant description provided by Joseph Farrell and Philip J. Weiser, *Modularity, Vertical Integration and Open Access Policies: Towards a Convergence of Antitrust and Regulation in the Internet Age*, Paper CPC 02-035, Competition Policy Center, University of California at Berkeley, 2002.

system. Finally, competition between digital systems, under certain – rather restrictive – conditions, may lead to competitive concerns that are not commonplace in traditional markets. Below, we briefly address each of these issues.

## 2.1 MODULARITY IN DIGITAL SYSTEMS

As many complex goods, digital system goods are inevitably characterized by modularity.<sup>36</sup> System goods indeed contain different modules, which account for different layers in a system architecture. Each layer performs a different function, and the sum of these functions determines the overall utility and potential of the system good. Figure 1 sketches the typical architecture of a digital system good such as a PC, a handheld device or a videogame console.

**Figure 1: Standard complementors in a digital system good**



As shown in the picture, each system is composed by a number of layers, normally termed “complementors”. For example, the PC system is composed by hardware (which contains different sub-layers, such as the

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<sup>36</sup> See Farrell and Weiser, *supra* note 35. See also Richard N. Langlois, *Modularity in Technology and Organizations*, *Journal of Economic Behavior and Organization* 49(1): 19-37, 2002; Raghu Garud, Arun Kumaraswamy and Richard N. Langlois, (Eds.) *Managing in the Modular Age: Architectures, Networks and Organizations*, Oxford, Blackwell, 2002.

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microprocessor, memory storage devices, peripherals etc.), an operating system, middleware (e.g. a Web browser or a media player), application software (such as PPAs) and content.<sup>37</sup> In a digital system good, each module is linked to adjacent layers through technical specifications known as interfaces. Interfaces are needed in order to have different layers “talk” to each other. When two complementors belonging to adjacent layers talk to each other, computer scientists normally define them as “interoperable”. Interoperability is a key issue whenever complementors are not produced by the same firm. In this case, we say that the system good exhibits an open architecture, and interoperability requires that complementor producers share some interface information, *i.e.* disclose the IPR-protected specifications needed to ensure effective communication between different complementors.<sup>38</sup> A hybrid case occurs whenever some layers of the system architecture are open to competition, while others are reserved to a single producer. For this reason, we distinguish between closed, semi-open and open system architectures:

- **Closed systems** correspond to fully integrated business models. All complementors are then produced by a single firm, which markets the whole system to end users without allowing any other firm to produce any of the layers in its system. Closed systems offer the advantage of central coordination and higher internal consistency of system products, as well as a reduced need to share one’s own intellectual property for the purpose of allowing interoperability between different complementors
- **Semi-open systems**, on the other hand, allow for some degree of competition in the production of some complementors. Therefore, they correspond to partially disintegrated production chains. This hybrid

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<sup>37</sup> Operating systems are in charge of governing hardware components and provide a basis for both middleware and application software. Middleware is defined as software that exposes APIs and therefore can suitably act as platform for application software. Applications, in turn, typically run on a “platform” (either an OS or a middleware programme) and support content. Finally, the end-user needs an interface in order to effectively make use of the good. In the case of the PC, this interface is provided by the operating system and is normally termed a “graphical user interface” (GUI). Economists developed the concept of “wetware” for the purpose of accounting for the effort and investment that end users have to undertake in order to learn how to effectively use the system good.

<sup>38</sup> This can be seen as a peculiar variant of the normal “make or buy” dilemma faced by most firms in an industrial context. See, with emphasis on the combination of IPR-protected complementors in a complex system good, Somaya, Deepak and Teece, David J., *Combining Inventions in Multi-invention Products: Organizational Choices, Patents, and Public Policy* (December 2, 2000). Haas School of Business CCC Working Paper No. 99-4. <http://ssrn.com/abstract=259889>.



system architecture has become the most successful driver of industry growth over the past two decades. Normally, such architecture emerges when one single firm wishes to keep a degree of “command and control” on its system, at the same time exploiting the many virtues of competition and network effects in all other layers. This reduces the overall system price, avoids double marginalization problems and, importantly, allows for almost-full exploitation of network externalities.<sup>39</sup>

- **Open systems**, at the other extreme, correspond to fully disintegrated models of industrial production. In an open system, firms engage in competitive races for the production of all complementors. A completely open system requires that all firms in the market can observe at least the interfaces adopted by each complementor in interoperating with the others, as well as the implementation of such interfaces by each vendor. As a consequence, open systems are often based on open source models in their OS, middleware and applications layers.

### 2.1.1 Inter-system competition, intra-system competition and perfect emulation

The nature of competition observed in the market differs, depending on the specific system architectures that arise in the market. For example, if there are only closed systems competing in the market, competition will closely resemble that between producers of non-complex goods, such as, say, T-shirts or baseball gloves. Since no competition within individual layers will be observed, we define this situation as “pure inter-system competition”.

On the other hand, when at least one system is semi-open, firms will be able to enter a competitive race within individual layers of that system. We call this situation “intra-system competition”. The degree of intra-system competition depends on the relative weight of semi-open systems in the industry. The more semi-open systems are widespread, the higher the chances, for industry operators, to compete in the production of an individual system complementor. In a situation of “pure intra-system competition”, all industry players compete within the same system architecture. The system, as a result, becomes the market.

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<sup>39</sup> Examples of this architecture are manifold, and include Sun’s server systems, the Windows system architecture for client PCs, PC systems based on Sun’s implementation of the Java programming language and many others. In all these system goods, platform vendors chose to leave some layers of the system open to competition.

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Finally, if all systems in the industry are open, each layer of every system will be perfectly contextable – i.e. all firms will be able to compete for the production of each complementor of all systems in the market. In this case, the competitive race will embrace all layers of each and every system, a situation which we term “perfect emulation”, since all firms can observe and replicate the features of leading complementors.

Inter-system competition, intra-system competition and perfect emulation are modes of competition that can be observed in most knowledge-based industries. The most common case occurs when markets are characterized by the coexistence of all three types of competition. An interesting dilemma would thus be whether competition authorities should steer market dynamics by imposing one mode of competition over the others. We tackle this issue in the next section.

### 2.2 WHICH ARCHITECTURE IS MORE EFFICIENT?

If a correct economic analysis of the different types of system competition suggested that one type is more efficient than all others, then such conclusion would serve as guidance for competition authorities as well as policymakers. However, as of today, it is very important to reaffirm that economists have shown no clear-cut set of reasons for preferring whatever type of system architecture over others. As a matter of fact, all system architectures exhibit comparative advantages as well as substantial drawbacks.

Indeed, it is normally the peculiarities of the single market environment, such as the existence of transaction and hierarchical costs, of learning or network effects or the intangible and digital nature of certain products, that determine which kind of architecture will eventually come to dominate the market. Where transaction costs and the need for central coordination are both high, closed or semi-closed systems tend to emerge in the market arena. To the contrary, whenever network effects play a paramount role, systems tend to open up their architectures in order to fully exploit the potential of positive feedback.<sup>40</sup>

Many examples of system architectures that were adopted in the home computing market can be easily recalled. Apple computers adopted a fully

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<sup>40</sup> For this same reason, economists have interpreted the gradual opening of the PC system architecture as the result of a declining need for central coordination in the PC system. See e.g. Randal Picker, *Pursuing a Remedy in Microsoft. The Declining Need for Centralized Coordination in a Networked World*, 158 *Journal of Institutional & Theoretical Economics* 113 (2002).

closed architecture when it marketed its Macintosh personal computer in the 1980s.<sup>41</sup> And a similar strategy was initially adopted by IBM, which later decided to open up its PC system by fostering competition at the OS layer.<sup>42</sup> Later on, under Microsoft's realm, the PC system gradually became a semi-open architecture. Today, Microsoft Windows is the main platform of a complex semi-open system.<sup>43</sup>

A semi-open system was also promoted by Sun Microsystems, with its implementation of the Java programming language.<sup>44</sup> Finally, the last few years witnessed the ascent of systems based on open architectures, such as those running open source OS, middleware and applications. Linux, for instance, is a successful OS distributed with an open source license, the GPL, which ensures that all implementations are left freely accessible to all developers wishing to emulate them or write compatible applications.<sup>45</sup>

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<sup>41</sup> Apple produced the hardware, operating system and application layer of the system, while allowing users to access third-party content on it. Apple manufactured all complementors, including hardware devices, the operating system and application software. As a result, there was no intra-system competition for the Macintosh, as Apple did not allow any other firm the possibility of marketing any of its system's complementors.

<sup>42</sup> IBM provided a number of industry players with the interface information needed to produce operating systems compatible with its hardware. In particular, Microsoft developed the MS-DOS, while competing OS producers developed alternative versions of the DOS, such as Novell's DR-DOS. The competitive disadvantage suffered by the DR-DOS as a consequence of Microsoft's choice to bundle the MS-DOS and the Windows 3.1 graphical user interface was under the spotlight in the first Microsoft case, ended in 1995 with a consent decree. The DR-DOS was later acquired by Caldera, which continued to claim that Microsoft illegally harms competition with its tying, vaporware and FUD strategies. See *Caldera v. Microsoft*, *infra* note 67.

<sup>43</sup> In Windows-based systems, competition is observed at all hardware layers – including the microprocessor (where AMD has gradually entered a market formerly dominated by Intel) – as well as at the middleware and application software layers. But only Microsoft can market the Operating System Windows, which acts as platform for middleware and application software and governs the functioning of all PC hardware devices.

<sup>44</sup> By exposing APIs, Sun's Java allows middleware products (such as Netscape Navigator) to act as platforms for application software, independently of the OS such programs run on. This product design strategy – which Sun emphatically marketed to application software developers as a “write once, run everywhere” feature – led Sun's application of Java to become a direct competitor to Windows in the race for becoming the leading platform in the PC system. Sun's system architecture was proprietary and semi-open, although Sun allowed third players to develop their own versions of the Java Virtual Machine. Such implementation was anyway subject to approval and certification by Sun itself. During the US proceeding, Sun Microsystems accused Microsoft of having willingly developed a proprietary Java Virtual Machine that did not fully meet Sun's requirements and threatened Java's “write once, run everywhere” feature. See Court of Appeals, *supra* note 9, Section B.5, 52.

<sup>45</sup> As a result, competitive strategies will focus on differentiation of customer services provided by competing firms, as we will explain in the next section.

### 2.3 NETWORK EXTERNALITIES AND LEARNING EFFECTS

Our discussion of the peculiarities of system competition proves particularly important when we deal with the assessment of competitive dynamics in high-tech markets. As we already mentioned, depending on the kind of system architecture, competition will be observed at some, at none or at all layers of a system. But it is the peculiarities of the market environment, much more than a top-down decision upheld by a regulator, that affect the choice of the preferred system architecture by industry players, as well as the type of system architecture that will eventually come to dominate the market. In particular, the architectural choice is strongly affected by three effects, which have been extensively analyzed by economists.

First, some layers of digital architectures are normally characterized by strong direct network externalities. Direct network externalities occur whenever a consumer's willingness to pay for one good increases along with the number of individuals that choose to use the good.<sup>46</sup> Typically, software exhibits some degree of direct network externalities.<sup>47</sup> Although software, unlike standard network goods such as a telephone, has an intrinsic stand-alone value, the value of some software programmes tends to increase along with the number of individuals that use them, i.e. their so-called customer installed base.<sup>48</sup>

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<sup>46</sup> For example, users attach a higher value to a telephone if other individuals possess a telephone: the higher the number of individuals using the telephone, the higher the possibility of connecting to other users. If only one individual possesses a telephone, the telephone is of no use and accordingly provides no utility to its user. Direct network externalities typically occur in two-way or multilateral networks, such as e2e networks. In such cases, the value of a network will increase exponentially as the number of its users increase linearly – a feature that is known as the “Metcalfe’s Law”, from the famous founder of 3Com Corporation and designer of the Ethernet protocol for computer networks. For a detailed description of direct network externalities, see Katz, M.J. C. and Shapiro, *Network Externalities, Competition, and Compatibility*, 75 *American Economic Review*, 1985, 424; Lemley, M.A. and D. McGowan, *Legal Implications of Network Economic Effects*, 86 *California Law Review*, 1998, 479; and Roberto Pardolessi and Andrea Renda, *How Safe is the King’s Throne? Network Externalities on Trial*, in Cucinotta, Pardolessi and Van Den Bergh (Eds), *Post-Chicago Developments in Antitrust Law*, Edward Elgar Publishing, February 1, 2003.

<sup>47</sup> See Pardolessi and Renda, *supra* note 46. A discussion on network externalities was also carried out by the competition authorities on both sides of the Atlantic. See Court of Appeals, *supra* note 7, at 11-13; and the Commission’s decision, §§515-522, arguing that the existence of network externalities determines the emergence of “strong associative links” between the client PC OS and the work group server OS markets, similar to those observed in *Tetra Pak II*.

<sup>48</sup> On the notion of customer installed base, see Lemley and McGowan, *supra* note 45. Network externalities particularly characterize application software such as Personal Productivity Applications or media players, since file sharing between end-users can occur only if such users

Secondly, platform layers in a system sometimes exhibit strong indirect network externalities, or – as economists sometimes term this phenomenon – “positive feedback”.<sup>49</sup> Put simply, users attach a higher utility to a given platform as the number of applications that run on that platform increases. Seemingly, application software developers attach a higher value to platforms that have a significant customer installed base. As a result, platform vendors deal with more than one category of consumers, and have to balance at least two sources of demand in order to successfully market their products.<sup>50</sup>

Thirdly, some layers of a system are characterized by a user interface – i.e., users need to learn how to use the product in order to gain some utility from its use. This phenomenon is normally termed “learning effect”. This normally happens for all software layers (OS, middleware, applications), much less for hardware layers in a system.<sup>51</sup> Users invest their time and mental resources in order to become familiar with the many specific functions of software programmes. This investment is a sunk cost users need to face before they can derive any utility from use of the system good. Once they have borne this sunk cost, however, they will find it irrational to switch to a competing product, at least before the initial sunk investment

use compatible tools to produce and consume such pieces of information. To the contrary, other application software programmes such as, say, business accounting suites are not usually meant for communication, and therefore do not feature significant direct network effects.

<sup>49</sup> See Shapiro and Varian, *Information Rules*, *supra* note 34.

<sup>50</sup> Consider the example of Windows, the *de facto* standard platform for client PC users: Microsoft has to attract the demand of both end users and application developers. The higher the number of users, the more attractive the platform will become for application developers. The higher the number of applications available for Windows, the more attractive the platform will become for end users. Authoritative economists have termed such peculiar phenomenon “two-sided market”. See David S. Evans, *The Antitrust Economics of Two-Sided Markets*, Yale Journal of Regulation, Summer 2003; David S. Evans, *Some Empirical Aspects of Multi-Sided Platform Industries*, Review of Network Economics, September 2003, Vol.2, Issue 3, at 191; and Jean-Charles Rochet and Jean Tirole, *Platform Competition in Two-Sided Markets*, Journal of European Economic Association, 2003. In two-sided markets, platforms that achieve a critical mass of both types of consumers will tend to become more and more popular. Platforms with a thinner customer base will inevitably lag behind in terms of popularity, and will find it hard to gain market share overtime. Nevertheless, vendors of successful platforms in two-sided markets will never be shielded from competitive pressure: as a better platform starts to spread amongst marginal customers, users will start migrating towards the higher-quality platform, leaving the formerly dominant vendor with low or no popularity at all. This trend is confirmed by market data from the software industry: see David Evans, *The Rise and Fall of Leaders in Personal Computer Software*, in David S. Evans (Ed.), *Microsoft, Antitrust and the New Economy*, Kluwer Academic Publishers, 2002.

<sup>51</sup> In particular, learning effects arise in the case of Personal Productivity Applications and – to a lesser extent, of Operating Systems, which provide users with a GUI or an “environment” in which they can find themselves at home.

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has been recouped. More in detail, users will switch to other platforms only in case the added value of such platforms more-than-compensates them for two additional costs: the unrecovered sunk investment they faced in learning how to use the “old” good, and the sunk investment required for the purpose of getting familiar with the “next” good.<sup>52</sup>

Direct network effects, indirect network effects and learning effects can significantly change the dynamics and welfare effects of system competition. In our opinion, the competitive assessment of observed conducts should be carried out with a view to the role played by these peculiar phenomena in the markets under scrutiny. In particular, competitive concerns may be expressed by antitrust authorities whenever a particular market is characterized by both strong network and learning effects, since the combination of those effects leads markets to tip towards the emergence of a single de facto standard, whose owner might end up being significantly shielded from competitive pressure over more than one product generation.<sup>53</sup>

### 2.3.1 System competition under network effects

To be sure, when markets are characterized by strong network effects, market forces “tip” towards the emergence of a single product, which will come to dominate the market for at least one generation of the product. Such peculiar dynamics is reflected in the particular type of competition that is observed in these markets. Since the market winner will dominate the market for one generation, market players will engage in an often furious competitive race *for* the market, instead of competing *in* the market. And, once one of the competitors has gained an edge over its rivals, as economists commonly say, “the winner takes all” the market.<sup>54</sup>

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<sup>52</sup> For this reason, OS vendors constantly try to develop more friendly graphical user interfaces. The simpler the interface, the smaller the sunk investment to be borne in order to switch to their product. Such a competitive strategy was under scrutiny in a number of important cases in the US, most notably *Lotus v. Borland*, 49 F.3d 807 (1st Cir. 1995).

<sup>53</sup> See Pardolesi and Renda, *supra* note 46.

<sup>54</sup> It is a commonly shared view in today’s economic theory that, since knowledge-based industries are characterized by network externalities, competitive concerns may arise as dominant firms will remain significantly shielded from competitive pressure, to the detriment of long-run consumer welfare. We strongly challenge this “monopoly crystallization” approach, since network effects are far from ubiquitous in knowledge-based industries. In several occasions, competition authorities have detected network externalities where there was no evidence of such effects. Examples of such mistaken approach are manifold. For instance, the FTC defined the market for Intel processors as characterized by strong network effects in *Intel v. Intergraph*. See *Intergraph Corp. v. Intel Corp.*, 3 F. Supp. 2d 1255 (N.D. Ala., 1998), *vacated*, 1999 U.S. App. LEXIS

Such peculiar dynamics is not particularly worrying from the standpoint of economic efficiency. To the contrary, only when industry players compete *for* the market consumers will be able to exploit the maximum potential of some information goods, such as software products. Figure 2 below shows a welfare analysis of competition *for* the market with network effects.<sup>55</sup> As shown in the figure, when firms compete *for* the market, in the so-called *pre-standard stage*, the market is highly competitive and the price is very close to the perfectly competitive level.<sup>56</sup> Once the market has tipped and the winner has taken all or most of the market for one generation, the product marketed by the winning player becomes more and more useful to consumers, which now attach a higher willingness to pay for its consumption, as a consequence of network externalities. In graphical terms, this spurs an outward shift in the demand curve. In the *de facto standard stage*, for sake of simplicity, we assume that only one firm operates in the market, the *de facto standard owner*.

As shown in Figure 2, if the shift in the demand curve is sufficiently large, consumer welfare will be higher under a constant overlapping of one-generation monopolists than under perfect competition *in* the market. Area B in the figure represents consumer welfare in the *de facto standard stage*, while Area A is the corresponding measure of consumer surplus with no tipping, at the *pre-standard stage*.<sup>57</sup>

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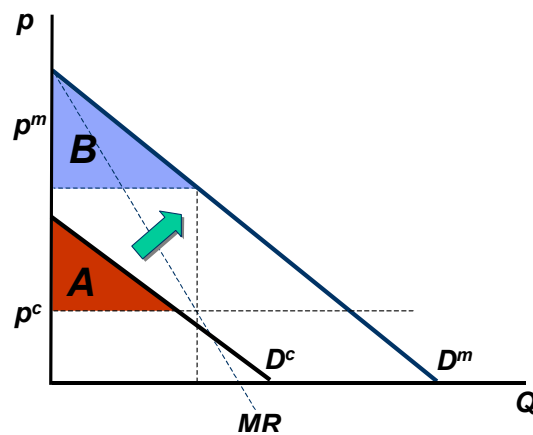
29199 (Fed. Cir., 1999). We disagree with such a view, since that relevant market – which, in and of itself, seemed oddly defined – was characterized neither by network effects, nor by learning effects. Microprocessors do not expose any user interface, nor allow for direct communication among users. They just allow – to a limited extent – for indirect network externalities, which have gradually disappeared once the hardware layer in the PC system architecture was opened up to competition.

<sup>55</sup> See Pardolesi and Renda, *supra* note 46.

<sup>56</sup> As a result, in most cases, prices in the pre-standard stage tend to be close to zero, since marginal costs for software products, as widely acknowledged, are normally negligible if compared to fixed investments for software development.

<sup>57</sup> Our analysis purportedly neglects a number of features that can affect the pricing and quantity decisions of software producers. In particular, the ease with which information goods can be rented or shared amongst users and the relevance of piracy in this industry affect the pricing decisions made by software vendors and eliminate almost all quantity restrictions related to the emergence of a monopoly (have you ever heard of anyone who couldn't afford to have Windows on its hard disk?). We decided not to take these effects into account in the paper, since their inclusion would not significantly change the scope and outcome of our analysis.

Figure 2 - Competition "for" the market under network effects



The welfare analysis shown in the figure also reveals that inter-system competition can, in certain cases, prove more welfare-enhancing than intra-system competition, depending on the intensity of pre-standard competition as well as on the magnitude of the shift in the demand curve. In order to understand why this occurs, consider that the intensity of pre-standard competition depends on two variables – the amount of profits that will be reaped by the winner and the probability of winning,  $p$ . The combination of these two elements determines the amount of “expected profits” for each of the competing players. Players will invest in R&D to the extent that the cost of R&D investments is lower than expected profits.

$$\pi^E = p\pi^W + (1-p)\pi^L$$

Where  $\pi^E$  is an individual player’s expected profit,  $\pi^W$  is the profit reaped by the winning player and  $\pi^L$  is the profit achieved by losing players – the latter being equal to zero in case of pure inter-system competition. When winners take all, competing players have the possibility of calculating their expected profit, depending on the kind of competition that emerges in the market. We distinguish between three different scenarios.



**Scenario 1. Pure inter-system competition.**

If players compete under pure inter-system competition, the expected profit will be reaped only by the winning player. Each player's expected profit will therefore be calculated as follows:

$$\pi^{E1} = p\pi^m$$

Where  $\pi^{E1}$  is the expected profit under scenario 1, and  $\pi^m$  is the monopoly profit. Accordingly, each player's investments in R&D will depend on the likelihood of winning the game. If the outward shift of the demand curve in the de facto standard stage is sufficiently large, competing firms will have a strong incentive to invest in R&D, since the expected profits are very high. Under this scenario, firms competing for the market have a clear incentive to cooperate ex ante, forming coalitions whose superior strength and customer base enhances the probability of winning,  $p$ . For this reason, "winner-takes-all" competition led to an increased tendency towards cooperation between competitors, which economists usually term "co-opetition".<sup>58</sup>

**Scenario 2. Pure intra-system competition.**

When players compete under pure intra-system competition, there will be no "winner takes all" game. All players will have the possibility to market all individual complementors, and the market will remain sufficiently competitive even in the de facto standard stage.<sup>59</sup> Now, let us assume there are only two players in the market. The winning player's profit ( $\pi^W$ ) will be as follows:

$$\pi^W = m\pi^c + (1-m)\pi^r$$

where  $m$  is the share of the market that will be held by the winning player, whereas  $\pi^c$  is the level of profits reaped in a more competitive market environment, and  $\pi^r$  is the royalties reaped from the losing player wishing to enter the market.

Accordingly, the losing player's total profit ( $\pi^L$ ) will be:

$$\pi^L = (1-m)\pi^c - (1-m)\pi^r$$

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<sup>58</sup> See A.M. Brandenburger and B.J. Nalebuff, *Co-opetition*, Currency Doubleday, 1996.

<sup>59</sup> We assume away all problems of quantity restrictions in the de facto standard stage. See *supra*, note 56.

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Where  $(1-m)$  is the market share achieved by the losing player. Finally, each player knows that she will reap the winning player's profit with probability  $p$  and the losing player's profit with probability  $(1-p)$ . This means that a given player's expected profit under intra-system competition ( $\pi^{E2}$ ) equals:

$$\pi^{E2} = p [m\pi^c + (1-m) \pi^r] + (1-p) [(1-m) \pi^c - (1-m) \pi^r]$$

In this situation, will the pre-standard competitive race be as fierce as in the case of pure inter-system competition? As economists usually answer most questions, "it depends". In our view, it depends on whether the expected profit in Scenario 1 is higher than the expected profit under Scenario 2. If  $\pi^{E1} > \pi^{E2}$ , pre-standard competition will be fiercer under pure inter-system competition. To the contrary, if  $\pi^{E1} < \pi^{E2}$ , competition will be fiercer under pure intra-system competition. Likewise, the industry players' incentive to engage in co-opetition will probably be lower under intra-system competition, unless the expected royalties set by the winning player are particularly high.

### **Inter-system v. intra-system competition**

Inter-system competition might end up being more welfare-enhancing than intra-system competition in knowledge-based industries, since it boosts incentives for beneficial innovation, fosters co-opetition and enhances the variety of system products available on the market. This occurs for a number of reasons, including:

1. **Steeper demand curve.** Since under pure intra-system competition end users find many interchangeable goods on the market, we expect the demand curve to become significantly more elastic, as consumers will face no significant costs, should they decide to switch to another complementor with a better price/quality ratio. Price competition, as a consequence, becomes particularly important under pure intra-system competition. Players wishing to enter the market only have to purchase the license for the de facto standard technology, and market their own version of the interoperable complementor. A flatter demand curve reduces the expected profits for competing players, and as a consequence stifles innovation and R&D investments.
2. **Higher variety.** In pure inter-system competition, firms compete with different technologies. As a consequence, their investments in R&D are to a large extent unrelated, and follow-on innovation is very limited. To the contrary, in pure intra-system competition, almost all R&D

investments are follow-on, incremental, and innovation proceeds with a more path-dependent pattern. Depending on whether incremental innovation is more desirable than disruptive innovation, one type of competition will end up being more socially desirable than the other.

3. **Stronger co-opetition.** In pure intra-system competition, competitors know that they will be allowed access to the de facto standard technology even if they lose the pre-standard race. For this reason, some will choose not to invest in R&D and pay the royalty for entering the market at a later stage. More in general, there will be lower incentives to form coalitions of competitors for the promotion of industry standards, since pre-standard competition is in general less risky.

In summary, in case the shift of the demand curve from the pre-standard to the de facto standard stage of the competitive race is substantially large, inter-system competition might prove more welfare enhancing than intra-system competition, since competition at the pre-standard stage will certainly be fiercer if players know that the winner will take all the market (at least) for one generation. If players know that they will be allowed access to the winning platform even if they lose the pre-standard competitive race, competition in the pre-standard stage will certainly be milder. And the beneficial effects of two-stage competition will not materialize.

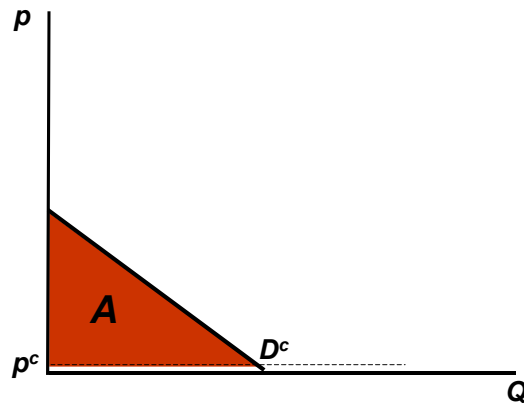
### **Scenario 3 – Perfect emulation**

At the other extreme, competition *for* the market will not take place if all market players adopt an open architecture. Consider the example of free software. In this case, since the winning technology will be adopted by all competing players at no cost, no pre-standard competition will take place. Firms competing under this scenario adopt a fairly different business model. In particular, revenues and profits are mostly drawn from customized services provided to users of a rather standardized underlying technology. Each firm operating in the marketing of a given complementor will have free access to the technology, and will be bound to implement such technology, tailoring it to the specific need of its customer. The technology will advance on a pure incremental basis, but for cases in which a path-breaking innovation determines a “forking” in the natural evolution of the specific technology.

In graphical terms, the “perfect emulation scenario” involves no shift in the demand curve.

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Figure 3 - Competition under "perfect emulation"



As a result, users will profit from very low market prices, since price equals marginal cost and fixed costs – at least when open source software is included in the system – are lower, as reported in the figure. However, in this case users normally have to pay for the IT services provided by software vendors in the many aftermarkets of the software value-chain (training, IT services, maintenance, technical support, software updates etc.).<sup>60</sup>

Accordingly, markets where standardization is clearly an asset will not select such a competitive environment, whereas markets in which consumers strongly need customized solutions and exhibit path-dependent consumption patterns (e.g. servers for large business) will tend to privilege perfect emulation environments. The latter situation occurs – at least partially – in the server industry, as will be clearer in the next sections.

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<sup>60</sup> This is what normally happens in the server industry, characterized by competing business models. On the one hand, proprietary software vendors tend to adopt a “two-sided market strategy”, in which platform vendors aim at achieving the de facto standard by building up customer base and applications installed base. On the other hand, producers that adopt open source software adopt a “Gillette strategy”, by giving away the platform and reaping profits through a combination of bundling, relational contracting, software customization and provision of a number of IT services. As a result, while proprietary software vendors try to enhance standardization in the market, other firms compete by moving from a standardized product (free software) to a non-standardized outcome (the customized product), a situation that deprives users of the benefits of standardization while enhancing those of *ad hoc* production of system goods. On this issue, see Andrea Giannaccari and Andrea Renda, *A Bug's Life: Reductionism, Holism and the Open Source Querelle*, LE Lab Working Paper n. IP-04-2004, forthcoming on [www.law-economics.net](http://www.law-economics.net).

### 2.3.2 System competition under network and learning effects

In the previous section, we stated that competition for the market should not elicit competitive concerns as far as product generations overlap quickly and *de facto* standard owners are never perfectly shielded from competitive pressures. However, once learning effects enter the stage, the whole picture might become more worrisome. As we already explained in a recent paper, when the market is characterized by both strong network externalities and learning effects, *de facto* standard owners may exploit a competitive advantage in the race for the *next de facto* standard.<sup>61</sup> Figure 3 depicts the welfare analysis of competition for the market when both network and learning effects are present. The outward shift of the demand curve is coupled by a change in the slope, which becomes steeper.<sup>62</sup>

Given that only significant price increases will determine a reduction in the quantity of products sold, in graphical terms, the demand curve will become more rigid, with mixed effects on consumer welfare. On the one hand, consumer surplus increases as consumers attach a higher value to products that they already know how to use. On the other hand, however, there is a substantial risk that consumers decide not to move to other, even better products, because of the magnitude of costs they would have to face in case they decided to switch. This market friction might ultimately hamper competition on the merits, determining the success of lower-quality goods instead of awarding market primacy to best-quality products. Put differently, learning effects facilitate path-dependent behaviour on the side of end users, which are then exposed to a risk of remaining “locked-in” the *de facto* standard product for more than one generation.<sup>63</sup>

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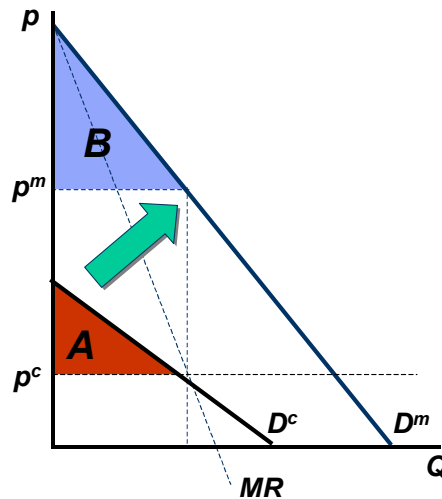
<sup>61</sup> See Pardolesi and Renda, *How Safe*, *supra* note 46.

<sup>62</sup> The reason for such change is straightforward. As a matter of fact, the initial investment borne by consumers for the purpose of learning how to use the product is a sunk cost. Switching to another product would imply that users leave aside the investments faced and invest new resources for getting familiar with the new product.

<sup>63</sup> On path-dependency and lock-in, see, *i.a.*, W.B. Arthur., *Competing Technologies, Increasing Returns, and Lock-in by Historical Events*, *Economic Journal*, 99, 1989, 116.

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Figure 3 - Competition "for" the market with network and learning effects



How does the lock-in problem affect competition in those markets where network and learning effects are both present? Economists put forward many explanations for the possibility that competition be stifled (and consumer welfare decreases) in these situations. Most of these explanations involve some form of strategic behavior on the side of the *de facto* standard owner:

Firstly, the *de facto* standard owner could try to crystallize its firstmover advantage over competitors by contractually forcing producers of complementors not to market and/or otherwise promote competing products.<sup>64</sup> Secondly, the *de facto* standard owner might try to design its product so that competing producers cannot easily emulate its user interface, and preventing third-party use of such interface by exercising its intellectual property rights. This would yield the effect of increasing the switching cost users would face in case they decide to move to a rival product. Thirdly, the *de facto* standard owner could attempt to monopolize those adjacent markets where competitors are trying to achieve a competitive edge that will allow them to threaten the *de facto* standard owner's paramount position in the system. A typical tool to achieve such leveraging strategy is the bundled sale of the two complementors, or, in

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<sup>64</sup> A suitable contractual tool for such strategy entails that the *de facto* standard owner threatens to withdraw the license for the *de facto* industry standard, in case a complementor producer decides to promote a rival product in any of the system layers.

other cases, the technological integration of the two products.<sup>65</sup> Fourthly, the *de facto* standard owner can adopt a number of commercial strategies aimed at reducing the likelihood that end users switch to competing products.<sup>66</sup> Finally, the *de facto* standard owner might try to influence end users' expectations over which product is going to win the next "winner-takes-all" game.<sup>67</sup>

In all these cases, the *de facto* standard owner takes action in order to achieve a competitive advantage that inhibits the natural overlapping of product generations that characterizes virtuous competition in markets with network effects. If this occurs, the *de facto* standard owner might indulge in *x*-inefficiency, to the extent that switching costs are so high that the dominant firm can feel completely shielded from competitive pressure. As we will see in the next section, the European Commission endorsed this view, by alleging that Microsoft adopted all the aforementioned strategies over the past few years, for the purpose of strengthening its strategic position as the *de facto* industry standard in the PC system.

## 2.4 NETWORKS OF SYSTEM GOODS

As we already explained, system layers are never used as stand-alone products. But in some cases, even system goods are not used as stand-alone products, and are interconnected by networks that govern the exchange of information between systems. Such networks might be of many different kinds, ranging from the mere interaction/communication between system goods (e.g., connecting two PCs through a parallel port) up to *n*-tier networks where PCs are governed by a number of larger, more powerful

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<sup>65</sup> Of course, this only occurs in the case of semi-open architectures, in which system platforms struggle for becoming the core complementor in the system.

<sup>66</sup> One of these strategies is versioning, which entails that the product is designed in scalable versions, and sold at different prices, in order to match the preferences of different categories of users and, consequently, extract more consumer surplus. On versioning, see Hal R. Varian, *Versioning Information Goods*, Working Paper, University of California, Berkeley, CA, 1997, available online at <http://www.sims.berkeley.edu/~hal/Papers/version.pdf> (last visited on August 19, 2004).

<sup>67</sup> Strategies that have been subject to antitrust scrutiny over the past few years include *vaporware* – i.e., announcing the launch of a new product long before its effective availability on the market for the purpose of convincing end users to wait for the new product – and *FUD* (Fear, Uncertainty, Doubt) – i.e. the diffusion of misleading and defamating information on competing products, aimed at decreasing end users' willingness to pay for competing goods. In particular, Microsoft's *vaporware* and *FUD* strategies were at the center of the often neglected *Caldera v. Microsoft* case, decided by District Judge Benson in 1999. See the main documents of the *Caldera v. Microsoft* case at <http://www.oreillynet.com/pub/a/network/2000/02/07/schulman.html> (last visited: August 19, 2004).

computers whose main role is to organize and manage network communication. Such powerful computers are normally termed “servers”, and the normal PCs interconnected onto a network are usually called “client PCs”. The need for communication between client PCs spurred the emergence of a wholly new market – that for server systems. A server system will typically include hardware devices, an operating system, middleware platforms and application software, mostly meant for facilitating the management of communication between interconnected users.

There are two different ways to look at the server industry from the standpoint of competition policy. First, servers can be seen as stand-alone system goods (“reductionist” approach). Alternatively, servers can be seen under a “system good” approach, which considers them as part of wider system goods, in which servers are complementors as well as client PCs (“Holistic approach”).

#### **2.4.1 A “stand-alone” approach to servers**

When seen as stand-alone products, server systems do exhibit the same architectural issues of client PCs. Accordingly, the architecture of server systems can be more or less open, depending on the choice of system platform vendors. The server industry exhibits a different degree of openness when compared with the client PC systems. Server systems will be typically more proprietary and integrated than client PCs, as confirmed by market data on major players, such as Sun, IBM, Novell and others. This is the result of a different mix of market effects in this specific sector. In particular, the server industry exhibits less marked direct network externalities than the client PC sector.

The market for OS installed on servers was at the core of the European Microsoft case. This market, however, is quite different from that of PC client OS that was scrutinized by the US authorities during the decade-long *US v. Microsoft* saga. It is of utmost importance to understand the difference between the two markets, for the purpose of assessing the merit of the Commission’s approach towards Microsoft’s conducts and their effects on the relevant markets.

First, the server OS market does not seem to exhibit significant learning effects, since end users in this market are professional users, skilled enough



to invest their resources in learning how to use several different systems.<sup>68</sup> Secondly, the server OS market does not seem to be characterized by substantial network effects: most large networks use different brands and proprietary technologies merged within the same system.<sup>69</sup> Finally, server OS products are seldom used as platforms for end-user applications, a fact that substantially limits their potential for spurring indirect network effects.<sup>70</sup>

As a preliminary conclusion, under a “reductionist” approach, there seems to be little room for competitive concerns as regards tipping and monopoly crystallization in the server OS market. And this impression is confirmed by market data, which show no evidence of tipping: the server OS market is indeed more heterogeneous than the client OS one, and includes complex *n-tier* system architectures where many different server OS coexist, and many different technologies interoperate. Such a heterogeneous market environment becomes even more complex for the simultaneous presence of different business models, some based on competition for the market, others based on customization of standardized products.<sup>71</sup>

Competition authorities will find it quite hard to detect the relative weight of different products in the same relevant market, and the calculation of market shares will necessarily produce uncertain and unreliable outcomes. This is what happened in the European Microsoft case, as we will highlight in Section 3.1. Considering servers as complementors under a wider “system good” approach leads to a more reliable snapshot of the

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<sup>68</sup> The amount of switching costs, as economists normally observe, will certainly be lower once the user has already undergone substantial investments in acquiring general skills in a given subject. And market evidence suggests that “sysops” (professional system operators) are often skilled in more than one programming language as well as in the operation of more than one server OS. Economists have learnt about the virtues of “acquiring general skills” as a strategy that minimizes learning investments since the seminal contribution provided by George Stigler, *The Economics of Information*, 69 *Journal of Political Economy*, 1961, 213.

<sup>69</sup> The European Commission adopted a fairly different view of network effects in the workgroup server market, by stating that “[t]he client PC operating system market, as well as the two other markets relevant to this case are characterised by strong direct and/or indirect network effects”. See the Commission’s decision, *supra* note 2, §1062.

<sup>70</sup> Of course, server OS also support applications. However, such applications are normally developed *ad-hoc* for large network operators, whereas in smaller networks, all applications are usually installed on client PCs.

<sup>71</sup> On competing business models in the server industry, see *supra*, note 60. Detailed descriptions are also provided by Bernard Reddy and David S. Evans, *Government Preferences for Promoting Open-Source Software: A Solution in Search of a Problem* (May 21, 2002), [ssrn.com/abstract=313202](http://ssrn.com/abstract=313202), as well as by K. M. Schmidt and M. Schnitzer, *Public Subsidies for Open Source? Some Economic Policy Issues*, *Harvard Journal of Law and Technology*, 16(2), 2002, 473-505.

competitive pressure exerted by industry players on apparently dominant firms.

## 2.4.2 Servers as complementors

If one considers servers as complementors in a server system, the perspective (and the consequences for competition policy) changes substantially. Server systems are valuable to their users insofar as they can effectively connect client PCs. Ensuring client-to-server interoperability is therefore crucial for effective marketing of a server system. In complex network architectures, server-to-server interoperability is also crucial, since servers that can communicate with other servers will be more easily employed in articulated, *n-tier* system architectures that involve use of servers based of different technologies.

### 2.4.2.1 Client-to-server interoperability

In order to have a client PC communicate with a server, the two systems need to be “talking the same language”. Computer experts would suggest that there are four main ways in which client-to-server interoperability can be provided when clients and servers are not based on the same technology:

- **Web-based protocols:** server OS and client OS based on different technologies can share non-native common protocols. All server applications that use Web-based protocols can interoperate with virtually any client.<sup>72</sup>
- **Gateway servers:** these servers act as virtual interpreters, able to translate the language used by the client in order to ensure interoperability with the server, and viceversa.<sup>73</sup>
- **Software added on client:** Client PC vendors install access software on client computers so that they can speak the “language” used by servers in the network.<sup>74</sup>

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<sup>72</sup> Server applications often use HTML or XML, the standard languages of the Internet, to communicate with clients. Client OS normally are sufficiently equipped to use HTML or XML, either because they include *ad hoc* software or simply through a Web browser.

<sup>73</sup> Such an approach is normally endorsed by major industry players for the purpose of achieving client-to-server interoperability.

<sup>74</sup> For instance, Microsoft provides software that enables its clients to connect to a server based on Novell’s NetWare as well as on variants of UNIX protocols such as NFS and NIS. And Novell markets client software that governs the interoperability between Windows client and NetWare’s

- **Software added on server.** On the other hand, servers can also be designed with an ability to speak different languages used by clients.<sup>75</sup>

Each of these systems allows for communication between client PCs and server systems. However, all these interoperability mechanisms entail additional application software and/or the installation of additional devices that govern client-to-server communication. This in turn shows that, as a matter of fact, only when a server and a client computer are designed with the same technology and share the same communication protocols, interoperability can be achieved immediately and at no cost. In this case, the operating system layers of both the server and the client computer can easily exchange files and interoperate for the purpose of performing a wide array of tasks. In all other cases, interoperability will be inevitably costly.<sup>76</sup>

Is this conclusion equivalent to a declaration of surrender in the attempt to achieve perfect communication between servers and clients based on different technologies? If this were true, under a system-good approach, the *de facto* standard operating system in the client PC industry would necessarily end up dictating the technology adopted by server systems. Experience and market data, however, testify that Microsoft client PC operating systems do interoperate with non-Microsoft server operating systems. Hence, interoperability achieved through any of the four ways listed above has proven sufficient to create a market in which server groups are highly heterogeneous, and large networks contain a number of different technologies that interoperate with one another.

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NDC network directory system. Even Sun, with its Solstice client, is reported to be marketing software whose main functionality is to ensure interoperability with other server technologies.

<sup>75</sup> This approach has been widely upheld by Sun during the past few years, especially through the PC NetLink software shipped with the operating system Solaris, which enables network users to interoperate almost perfectly with Windows-based clients. See *Solaris PC NetLink Software*, available online at <http://www.sun.com/interoperability/netlink/index.html>, which states, "Solaris PC NetLink supports all major Windows client operating system releases, including Windows NT 4.0, Windows 95/98, Windows 2000."

<sup>76</sup> An example will allow us to clarify this concept. Imagine two individuals who speak different languages, say French and German. How can communication be ensured between the two? First, the French-speaking could invest some resources in learning German, and this will allow her to communicate (although far from perfectly) with the other individual. Secondly, the German-speaking might invest resources in order to learn how to speak French. Thirdly, both individuals can speak in a third language, say English or Italian. Fourthly, they can hire an interpreter that will facilitate communication. Of the prospected solutions, the only one that would allow for perfect communication without additional investments is the fifth – i.e., none of the four. Perfect communication can be achieved at no cost only if the two individuals speak the same language.

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Notwithstanding such evidence, as will be explained in further detail in the next section, the European Commission has stated that the only way to ensure full interoperability between clients and servers is to ensure that they act as if they were based on the same technology, by allowing a full specification of the APIs contained in the server OS, which govern interoperability between clients and servers, and opening the door to de facto perfect emulation of Microsoft OS products.<sup>77</sup>

### 2.4.2.2 *Server-to-server interoperability*

Considering servers as complementors also leads to tackling the issue of communication between servers based on different technologies, besides hinging on the need to have clients and servers communicate. Server-to-server interoperability becomes important whenever networks are complex and articulated enough to require more than one server system for the purpose of governing communication between client PCs. Large networks normally are structured along *n-tier* architectures, with different tiers containing servers based on different technologies and dedicated to different tasks. Firms wishing to use large networks have the choice of setting up a whole network based on one technology, or to resort to different technologies for performance of different tasks.<sup>78</sup>

When networks are heterogeneous, server-to-server interoperability needs to be ensured either by sharing interface information, by adopting common standards or by resorting to external applications which act as intermediaries between the two technologies, making them interoperable. As we already recalled, market data confirm that the server OS market is much less subject to tipping than the client OS one, and is populated by large networks in which servers based on different technologies interoperate with one another and with Windows-based clients.

Under a “system good approach”, competition authorities are in charge of ascertaining that the peculiar market environment in the key layer – the client OS one – does not end up dictating the technologies that will dominate other layers – in the case at hand, the server OS market. Under this wider perspective, the server OS market ends up closely resembling an aftermarket, where the demand is driven by the decisions taken by end

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<sup>77</sup> See *infra*, note 100 and accompanying text.

<sup>78</sup> Such tasks include domain control, file and server services, group and authentication services, mission-critical applications and many others.

users in the primary market – the market for client OS.<sup>79</sup> The extent to which the secondary market equilibrium can be harmfully affected by the competitive environment observed in the primary market strongly depends on the aftermarket’s tendency to tip, as well as on the behaviour of the firm that dominates the primary market. Although server-to-server and client-to-server interoperability were under the spotlight in the EU Microsoft case, the Commission failed to realize that the peculiarities of the server OS (after-)market hardly spurred serious competitive concerns, and that – for reasons that included network and learning effects – market data revealed that the dominant technology in the primary market did not dictate the dominant technology in the aftermarket.

### 3 THE COMMISSION’S CASE

The European Commission’s case against Microsoft started in 1998, after a complaint filed by Sun Microsystems, one of Microsoft’s rivals in the server OS market. Since then, the Commission has issued three Statements of Objections. As we already explained in Section 2, the allegations expressed by the Commission against Microsoft are basically two.

First, according to the Commission, Microsoft refused to supply interface information contained in its work group server OS, which competitors would need in order to achieve full interoperability with Microsoft Windows client OS. More in detail, Microsoft is alleged to have preserved hidden, privileged connections between its products on the client and on the server side in order to hamper competitors in the work group server OS market. Since Microsoft holds a dominant position in the client OS market, rivals in the work group server OS market would find themselves foreclosed from the relevant market if the Redmond-based company does not disclose the necessary interface information for client-to-server interoperability.<sup>80</sup>

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<sup>79</sup> The notion of aftermarket has come under the spotlight in economic theory since the famous *Eastman Kodak v. Image Technical Services, Inc.* 514 US 451 (1992). See, i.a., Dennis Carlton and Michael Waldman, *Competition, Monopoly and Aftermarkets*, NBER Working Paper 8086, 2001; and Borenstein, S., J. Mackie-Mason, and J. Netz, *Antitrust Policy in Aftermarkets*, *Antitrust Law Journal*, 1995, 63, 455-482.

<sup>80</sup> See Commission’s decision, at §1064: “As regards the refusal to supply abuse, Microsoft has engaged in a *general pattern of conduct* which focuses on the creation and sole exploitation of a range of privileged connections between its dominant client PC operating system and its work group server operating system, and on the disruption of previous levels of interoperability. The interoperability information at stake is indispensable for competitors to be able to viably compete in the work group server operating system market.” (*emphasis in original*).

Furthermore, the Commission alleged that Microsoft unduly bundled Windows with an application software for media streaming, Windows Media Player. By technologically integrating the media player into the operating system, Microsoft *de facto* forced OEMs to preinstall Windows Media Player on their machines. End users, hence, inevitably found Microsoft's software for media streaming already installed on their PCs. Such circumstance, according to the Commission, determined a substantial lessening of competition on the merits in the media player market, such that competitors would be gradually foreclosed from the market, leaving Microsoft with the possibility of plodding along with low-quality products and drown in *x*-inefficiency, to the detriment of end users.

On these bases, the Commission decided that Microsoft should be bound to disclose relevant interface information to competitors in the server OS market – so that they can achieve “full interoperability” with PC Client Windows OS and Windows server OS – and to market a stripped-down version of Windows, which does not integrate the Media Player – so that competing media players are not foreclosed from the market.

### **3.1 REFUSAL TO SUPPLY INTERFACE INFORMATION: HEAVY CLOUDS, NO RAIN...**

The European Commission's allegation that Microsoft infringed article 82 of the EC Treaty by abusing its dominant position in the market for PC client OS and in the market for work group server OS is based on Microsoft's incomplete disclosure of information relative to “specifications for the protocols used by Windows work group servers in order to provide [...] services to Windows work group networks”<sup>81</sup>. Microsoft's strategy allegedly consisted in preserving privileged connections between its client PC operating system and its work group server operating system, in order to retain a comparative advantage over rivals such as Sun, Novell, IBM and others for what concerns client-to-server and server-to-server interoperability. Such privileged connections are related to the main tasks normally performed by work group servers, such as group and user administration services and file and print services.

Group and user administration services that are best performed by Windows server operating systems include: a) *directory services*, which are provided by Active Directory in Windows domains; b) *trust relationships* services, which Windows performs through the Global Catalogue service;

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<sup>81</sup> See the Commission's decision, *supra* note 2, at §187.

c) *security and authentication services*, which Microsoft provides through its implementation of the Kerberos protocol<sup>82</sup>; and d) *group management services*, which Microsoft implements through its Group Policy feature.

On the other hand, file and print services listed by the Commission include: a) *network file systems*, which Microsoft provides through its CIFS/SMB; and b) *distributed file systems*, represented by Microsoft's Dfs.

The Commission specifies that both categories of services are provided by Microsoft as a "*set of interrelated services*".<sup>83</sup> This stems from the fact that most file and print services use the Kerberos protocol for authentication, and rely on the ability to create Access Control Lists for users wishing to avail of those services on a Windows network - something only a Windows OS can achieve.<sup>84</sup> Through an allegedly incomplete disclosure of this set of interrelated services, Microsoft was able to leverage its dominant position in the client OS market, achieving a parallel dominant position in the work group server OS market.

Yet, the story does not end up here. According to the Commission, the lack of sufficient interoperability between non-Microsoft server operating systems and Windows operating systems that run on client PCs also depends on a number of specifications contained in Windows client OS, not only in Windows server OS. More precisely, "there is in many cases symmetry between server-to-server and client-to-server interconnection and interaction".<sup>85</sup> This occurs since, "[i]n order to transparently deliver their services to the client PC user, Windows work group servers use the presence of specific pieces of software code in the Windows client PC operating system".<sup>86</sup> Such pieces of code are related to Microsoft's Dfs and to Active Directory.

Finally, in other cases client-to-server and server-to-server communication is implemented in Windows domains by means of the same "hidden" protocols. On this point, the Commission mentions the Kerberos protocol and the ADSI interface, defined as "[t]he primary and recommended API for accessing Active Directory".<sup>87</sup>

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<sup>82</sup> *Id.*, at §§251-272. Before the marketing of Windows 2000, Microsoft used the so-called NT LAN Manager (NTLM), released by Microsoft back in 1989, for authentication services. See *Id.* at §152.

<sup>83</sup> *Id.*, at §176 (*emphasis in original*).

<sup>84</sup> *Id.*

<sup>85</sup> *Id.*, at §179.

<sup>86</sup> *Id.*, at §176.

<sup>87</sup> *Id.*, at §§246 and note 327.

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Since both client-to-server and server-to-server interoperability were at stake, the Commission concluded that Microsoft should be bound to disclose information contained in both server and client OS, in order to facilitate full interoperability between non-Windows servers and both Windows server and Windows clients.

The Commission's decision never mentions the issue of monopoly leveraging as playing a significant role in Microsoft's strategy. But it is evident that the contested infringement is one of technological leveraging. And it is also evident that the Commission hinged – although implicitly – on the so-called essential facility doctrine in order to overcome the problem of Microsoft's intellectual property rights while imposing mandatory disclosure of information otherwise protected by copyright, patent rights or trade secrecy.

As a matter of fact, in the first two Statements of Objections, the Commission explicitly based its whole case on an allegation of technological leveraging of Microsoft's paramount position in the client OS market, with the intermediate aim of monopolizing the work group server OS market, and the ultimate one of preserving its quasi-monopoly position in the client OS market. In the Statements of Objections and in the Final Decision, the Commission extensively applied the *Tetra Pak II* case as closely matching the kind of strategy allegedly implemented by Microsoft.<sup>88</sup>

As we already recalled, the technological leveraging allegation initially involved also a leveraging of Microsoft's paramount position in the market for client PPAs (Personal Productivity Applications), where the Office Suite dominates competing products.<sup>89</sup> According to the Commission, Microsoft willingly preserved hidden and privileged connections between client PPAs and its server OS, so that a number of tasks performed by Microsoft server OS on Microsoft PPAs could not be equally performed by using a non-Microsoft server OS. Such an allegation was later released by the Commission.

As regards the essential facility doctrine, its importance in the Commission's rationale emerges from the caselaw quoted in the final decision. As widely known, decisions like *Magill* and – more recently – *IMS*

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<sup>88</sup> *Id.*, at §§527-529. The Commission is clear in stating that “[a] comparison of the relevant operating system markets and an evaluation of Microsoft's position on both reveals a degree of inter-relation which is similar to the one that was found to prevail in *Tetra Pak II*”. *Id.* at §529.

<sup>89</sup> See *supra*, Section 1.2, footnote 30 and accompanying text.



*Health* imply that a dominant player's refusal to supply IPR-protected information may be deemed anticompetitive only in exceptional circumstances. More precisely, in *Magill* the exercise of an exclusive right by a dominant undertaking was found to represent an abusive conduct whenever: a) the refusal prevented the emergence of a new product – better, a new market; b) the firm's conduct had the effect of foreclosing competitors from a secondary market; and c) the refusal was not objectively justified. Similarly, in *Bronner* – although the contested conduct did not involve withholding of IPR-protected information – the refusal to open the distribution system was found to be infringing article 82 of the EC Treaty only when such system is essential to carry on business in the relevant market, the refusal is likely to eliminate all competition and is not objectively justified. The latter conditions appear quite challenging and restrictive, if compared with the Commission's case in *Microsoft*. Nevertheless, the Commission stated that its approach in the case at hand is consistent with *Bronner*, and specified that the set of exceptional circumstances listed in *Magill* should not be held as a *numerus clausus*.<sup>90</sup> In other words, the Commission claimed its freedom to evaluate further details of the contested conduct, which might lead to concluding that the dominant undertaking actually abused its market position, even when the exceptional circumstances listed in *Magill* or *Bronner* are not met.

The Commission also quoted cases like *Volvo*, *Commercial Solvents* and *Micro Leader Business*, in which a comprehensive analysis of the defendant's behaviour had led the Commission to identify an infringement of article 82.<sup>91</sup> The main criterion adopted by the Commission in the analysis of Microsoft's refusal to supply interface information – in particular, to Sun Microsystems – is the evidence that the dominant firm's behaviour “puts Microsoft's competitors at a strong competitive disadvantage in the work group server operating system market, to the extent where there is a risk of elimination of competition”, which accounts for one of the three “exceptional circumstances” listed in *Bronner*.<sup>92</sup>

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<sup>90</sup> The Commission states that “[i]ndeed, disclosure of interface information by Microsoft is indispensable for competitors in the work group server operating system market to carry on business. Microsoft's behaviour of progressively diminishing such disclosures risks eliminating competition in the market and cannot be objectively justified.” See Commission's decision, *supra* note 2, footnote 670 and accompanying text.

<sup>91</sup> “[T]he factual situations where the exercise of an exclusive right by an intellectual property right-holder may constitute an abuse of a dominant position cannot be restricted to *one* particular set of circumstances”. *Id.*, at §557 (*emphasis in original*).

<sup>92</sup> *Id.*, at §589.

As we will explain in the next sections, many of the logical steps followed by the Commission in the competitive assessment of Microsoft's conduct in the server market appear quite criticizable and evanescent. In what follows, we will focus on three main issues, namely the Commission's market definition exercise, the technological leveraging allegation and the Commission's assessment of Microsoft's refusal to supply interface information.

### 3.1.1 "Acrobatic" Market Definition

As we already recalled, the European Commission found Microsoft to have infringed article 82 by illegally leveraging its dominant position in the PC client OS market into the market for low-level server OS. Such an infringement may be sanctioned both under an essential facility label and a technological leveraging approach. Whatever is chosen, in order to assess the Commission's decision one piece of evidence needs to be ascertained: the defendant ought to enjoy a dominant position in the relevant market. For this reason, the Commission's market definition exercise becomes of utmost importance in the overall evaluation of the case. But what is the relevant market in *Microsoft*?

Initially, the Commission decided to identify a separate relevant market for operating systems installed on so-called entry-level servers, as defined by the International Data Corporation, the leading market data provider for high-tech industries. Entry-level servers were identified with systems costing less than 100,000 USD.<sup>93</sup> For this set of products to be defined as a relevant market, according to the Commission's 1997 *Notice on the definition of the relevant market*, no other product should be "regarded as interchangeable or substitutable by the consumer, by reason of the products' characteristics, their prices and their intended use".<sup>94</sup> This market definition, however, was heavily criticized during the proceeding, for a number of reasons.

As a first remark, the Commission was not segmenting the market on the basis of prices charged for server OS, but relied on prices charged for entire systems, composed - as we showed in Section 2 - by hardware, OS, Middleware, Applications etc. Work group servers and larger network servers normally differ in terms of hardware, rather than software. Larger servers normally come with more memory storage, more powerful

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<sup>93</sup> See *supra*, note 31 and accompanying text.

<sup>94</sup> European Commission, *Commission Notice on the Definition of the Relevant Market for the Purposes of Community Competition Law*, Official Journal, OJ C372, 9 December 1997.

processors, more sophisticated security devices, higher interconnection capacity. On the other hand, the OS core technology is normally the same for work group servers and larger network servers.

Sure, OSs sold for larger network servers differ, to some extent, from workgroup server OSs. As in many markets for information goods, OS vendors normally engage in versioning of their products, which enables them to price-discriminate between different categories of server users.<sup>95</sup> OSs are anyway developed on a common core technology, and then made – in the techies’ jargon – “scalable”. OSs marketed for larger servers are able to interconnect more servers and more clients than those used by work group server sysops.<sup>96</sup> But this in turn implies that, should a hypothetical monopolist slightly raise its price in the workgroup server sub-market, immediate entry would inhibit whatever chance of reaping extra-profits. When this test – called the *SSNIP* test – fails, antitrust practitioners conclude that the relevant market should be enlarged in order to embrace also firms that would immediately enter the market.

Finally, add that, in a system architecture, normally one large server substitutes for many small servers, depending on the free choice of system operators. There are advantages and disadvantages in both available network architectures. In other words, even if we reason in terms of systems, there is a clear pattern of substitution between systems that were included in the relevant market and systems that were excluded from it. And this is contrary to sound economic theory as regards market definition exercises.

In conclusion, the debate on the Commission’s market definition exercise highlighted that there seemed to be no separate relevant market for entry-level server OSs. More importantly, had the market been defined as the wider server OS market, evidence suggests that Microsoft would have come out with a much lower market share, certainly smaller than that held by the UNIX family of Operating Systems.<sup>97</sup> As a result, the whole rationale adopted by the European Commission – be that based on a technological

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<sup>95</sup> On versioning, see *supra*, note 66 and accompanying text.

<sup>96</sup> The retail price for Windows server family of products normally depends on the number of clients (better, Client Access Licences or CALs) that can be interconnected by the individual OS. The Commission reported in detail the number of CALs supported by Windows server OS and the corresponding price. See the Commission’s decision, *supra* note 2, at §§371-373 and Tables 3-4.

<sup>97</sup> During the proceeding, data on revenue-based shares were provided by Microsoft on the basis of IDC *Worldwide Client and Server Operating Environments Market Forecast and Analysis Summary, 2001-2005*, Report #25118, August 2001.

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leveraging or on a refusal to supply allegation – was inevitably doomed to tumble down, just like castles made of sand.

For this reason, during the proceeding, the Commission modified its definition of the relevant market. The result is an even narrower market, defined as operating systems installed on “work group servers”. The difference between work group servers and other servers is twofold. On the one hand, work group servers belong to a specific price band – servers costing less than 25,000 USD. On the other hand, the Commission’s new market definition is task-based, meaning that the tasks normally accomplished by work group servers are substantially different from those performed by other, higher-level servers. More in detail, work group servers normally provide file and print services and group and user administration services, whereas higher-end servers normally are dedicated to mission-critical applications.

Despite this attempt to reshape the definition of the relevant market, we still argue that the main problems encountered by the first market definition exercise by the Commission have not been solved. Such a patent clumsiness in dealing with market definition issues calls for more sound economic research and analysis in Brussels. In particular, the Commission failed to adopt a “system good” approach, which would have prompted a more reliable picture of the relative weight of competing producers in the relevant market. The possibility of adopting a “Gillette strategy” in markets where direct network and learning effects are not significant opens up the market door to many potential competitors. All-time giants such as IBM and Sun already switched to this new business model, and seem to be reaping their humongous investments by charging supracompetitive prices for aftermarket IT services provided to their fidelized customers.<sup>98</sup> A standard market definition exercise would certainly fail to take this form of competition into account.

### 3.1.1.1 “Creative” calculation of market shares

The gray picture that emerges from the Commission’s market definition exercise in *Microsoft* becomes even darker, if one looks at the way market shares were computed during the proceeding. The European Commission chose to calculate market shares on a volume basis, rather than relying on value or revenues. Below, we explain why we find this approach to be at least regrettable.

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<sup>98</sup> See *supra*, note 60 and accompanying text.

As a matter of fact, even the narrow work group server market is highly heterogeneous, and includes products with different business models, price levels, technologies and task specializations. Economists suggest that in heterogeneous markets volume-based shares may constitute an extremely imperfect proxy of firms' relative strength. The Commission itself shared this approach in a number of decisions, even when the relevant market was characterized by strong network effects (as in *MCI/Worldcom*)<sup>99</sup>. The 1997 *Notice on the definition of the relevant market for the purposes of Community's competition law* specifies that, "[i]n cases of differentiated products, sales in value and their associated market shares will usually be considered to better reflect the relative position and strength of each supplier".<sup>100</sup>

Nevertheless, two main reasons led the Commission to initially rely on volume-based rather than value-based (revenue-based) market shares in determining Microsoft's relative competitive position in the relevant market. First, the Commission stated that network effects are related to numbers in use, not in dollars. This implies that, in order to fully take into account network externalities, emphasis must be put on the undertaking's installed base, i.e. on the number of users that actually choose to make use of the firm's product. Secondly, the Commission recalled that a relevant part of the operating systems marketed in the relevant market is distributed under a free software license. Accordingly, calculating revenue-based market shares would lead to necessarily understating the market share held by Linux and other open source operating systems.<sup>101</sup>

Although these reflections are appropriate, the approach adopted by the Commission seems far from correct, for a number of reasons. As we already recalled, there is a clear pattern of substitution between one large server and many smaller servers. This means that calculating market shares on the basis of units sold provides an overly distorted picture of the relative competitive position of server OS vendors, and leads to unduly overstating the market share held by vendors of OSs for smaller servers, such as Microsoft. Such conclusion is strengthened by the inherent and ubiquitous scalability that characterizes server OSs as they are marketed today.

In summary, there seems to be no reason to abandon a Commission's almost consolidated approach just for the Microsoft case. This conclusion appears even more important since Microsoft's revenue-based share in OSs

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<sup>99</sup> Case IV/M.1069 *WorldCom/MCI* [1999] Official Journal L 116, pages 0001-0035 at §101.

<sup>100</sup> See the 1997 *Notice on the definition of the relevant market*, *supra* note 94.

<sup>101</sup> See the Commission's Second SO, *supra* note 30, §121 and footnote 158.

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for servers costing less than 100,000 USD was found to be much lower than that held by UNIX. Under this modified perspective, Microsoft indeed would appear far from dominant in the relevant market (so narrowly) defined by the Commission: the constellation of UNIX flavours would come out as holding a larger share than Microsoft.<sup>102</sup>

In the Final Decision, the Commission significantly revised its approach to market share calculation, in order to respond to the criticisms elicited by its exclusive reliance on unit-based shares. After further narrowing its definition of the relevant market, from (price-based) entry-level server OS to (task- and price-based) work group server OS, the Commission provided figures both for volume-based and value-based shares. The Commission also provided volume-based shares relative to the market for OSs installed on servers costing less than 100,000 USD, but failed to provide value-based shares for this market. As a result, Microsoft was found to have achieved a dominant position in the market for work group server OSs, with a share of (at least) 60% in 2002.<sup>103</sup>

Here again, we argue that the Commission should undertake extensive research on the approach to market share calculation in high-tech, path-dependent markets. Firms adopting a “Gillette strategy” certainly came out of the market definition exercise with too low a share. And proprietary software vendors that adopt a “two-sided” market strategy had their share overstated and consequently were the subject of overly emphatic competitive concerns. In particular, the relative weight of products marketed with different business models should be carried out with an eye to each product’s total cost of ownership (TCO), more than relying on unit sold and/or revenues.<sup>104</sup>

### 3.1.2 Technological leveraging

We already stressed that the Commission’s case, although rephrased in terms of a refusal to supply allegation, hides a more substantial allegation of technological leveraging of Microsoft’s dominant position in the client OS market into the work group server OS market. In order to comply with

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<sup>102</sup> To complete the picture, please note that the Commission told a completely different story when it came to calculate market shares in the market for Personal Productivity Applications, a branch of the case that was later abandoned in Brussels. Notwithstanding the paramount importance of network effects in this market, the Commission decided to rely on value-based shares instead of hinging on unit-based shares. Strangely enough, in that market, Microsoft’s share is lower in terms of volume than in terms of revenues.

<sup>103</sup> See the Commission’s decision, *supra* note 2, at §499.

<sup>104</sup> On this issue, see Andrea Giannaccari and Andrea Renda, *supra* note 60.

the requirements of sound economic theory, a leveraging allegation must prove at least the following three elements.<sup>105</sup> First, the defendant must hold a dominant position in the tying market. Secondly, the defendant must have achieved a dominant position in the tied market. Thirdly, a suitable tool for exercising leveraging from the tying to the tied market must have been available to the defendant.

According to the Commission's view expressed in the first two Statements of Objections, all three requirements are satisfied in the Microsoft case. Microsoft is undoubtedly dominant in the market for PC client OSs and has achieved dominance in the market for work group server OSs by means of a suitable tool, i.e. technological leveraging by withholding relevant interface information and preserving hidden, privileged connections between Microsoft client and server software products.

As we already recalled, that the leveraging allegation still lies at the core of the Commission's approach is confirmed by the reference to the (in)famous *Tetra Pak II* case in many passages of the Decision. In the Commission's view, "[a] comparison of the relevant operating system markets and an evaluation of Microsoft's position on both reveals a degree of inter-relation which is similar to the one that was found to prevail in *Tetra Pak II*."<sup>106</sup> Indeed, the Commission found Microsoft to be dominant in both the client PC OS market and in the workgroup server OS market on the basis of the "closely associative links" existing between the two relevant markets as well as on the following findings: a) a substantial proportion of customers had purchased both Windows Server OS and Client OS; b) Microsoft is a quasi-monopolist of client OS, with approximately 90% of the market, c) the main producers operated on both markets; and d) by virtue of its quasi-monopoly, Microsoft was able to focus its competitive efforts on the server OS market without fear of retaliation in the client OS market.<sup>107</sup> The Commission also noted the existence of technological links, in addition to commercial links, between the two relevant product markets, stemming from the interdependence of servers and clients within computer networks.<sup>108</sup>

However, if *Tetra Pak II* is a precedent applicable to Microsoft, it is an ominous one. As a matter of fact, *Tetra Pak II* was heavily criticized because, in spite of the "leveraging" allegation, the contested abuse and the effect of

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<sup>105</sup> See, e.g., Michael Whinston, *Tying, Foreclosure, and Exclusion*, 80 AM. ECON. REV. 837 (1990).

<sup>106</sup> See Commission's decision, *supra* note 2, at §529

<sup>107</sup> *Id.*, at §527.

<sup>108</sup> *Id.*, at §533

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the abuse occurred in one and the same market, the so-called tied market, where no hegemony had been found: on the one hand, leveraging should not be resorted to in order to avoid the critical task of proving a dominance to be abused; on the other hand, the mere fact that a monopolist in one market benefits from that monopoly while competing in a second market is not, in and of itself, unlawful.<sup>109</sup> Here, as in *Tetra Pak II*, the Commission is scrutinizing a conduct that was adopted by Microsoft in the market for work group server OSs. And the remedies sought mostly concern the “tied” market, not the “tying” market.

At any rate, *Tetra Pak II* could at most represent the starting point for an allegation that Microsoft has willfully limited client-to-server interoperability by failing to disclose interface information contained in its client OS to competing producers of server OSs. But, as far as server-to-server interoperability is concerned, it suffices to say that there can be no leveraging within the same market. Since the Commission imposed Microsoft a duty to disclose interface information contained – for the most part – in the server OS, rather than in the client OS, the “Tetra Pak II fallacy” seems to have permeated the Commission once and again.

On balance, we consider the Commission’s allegation of illegal technological leveraging in *Microsoft* as misconceived, with specific emphasis on the reference to server-to-server interoperability. Precisely the fact that server-to-server communication was constantly under the spotlight in the *Microsoft* case might, after all, cast doubts on the Commission’s original intentions. There is, as we will shortly see, room to believe the Commission was initially willing to impose disclosure of copyrighted information to rivals, in order to allow – more than for mere interoperability – for perfect emulation of Microsoft’s copyrighted products. Something got wrong along the way...

### 3.1.3 Refusal to deal with rivals in the post-Trinko era

As we just recalled, in the Final Decision the Commission decided to abandon the allegation of technological leveraging, embracing refusal to supply as the main abuse purported by Microsoft in violation of article 82. Of course, such an allegation implies that a number of elements be proven,

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<sup>109</sup> See e.g., *Brief for the United States and the Federal Trade Commission as Amici Curiae Supporting Petitioner*, at 15, *Verizon Communications, Inc. v. Law Offices of Curtis V. Trinko, LLP*, 124 S.Ct. 872 (2004) (No. 02-682), specifying that “conduct is not exclusionary or predatory unless it would make no economic sense for the defendant but for its tendency to eliminate or lessen competition.”



as was specified by the rationale of the European Court of Justice in *Magill*, *Bronner* and, more recently, *IMS Health*.<sup>110</sup> First, Microsoft must be found to hold an essential input for competitors wishing to operate in a secondary or adjacent market – in this case, the market for work group server OSs. Such input must be essential to the point that entry in the secondary market should be unfeasible without “reasonable access” to the infrastructure. Secondly, Microsoft’s abusive conduct must have created a substantial risk of elimination of competition from the secondary market. Thirdly, the refusal to supply interface information must not have been objectively justified.

In our opinion, to assert that the three elements are present in *Microsoft* means walking on a quite tortuous path, if not on a tightrope. In particular, three main issues stand against any attempt to consistently apply the doctrine of refusal to deal with rivals to the EU Microsoft case. First, we question that the interface information withheld by Microsoft is essential to carry on business in the relevant market, however oddly such market is defined. Market data testify that client-to-server interoperability is actually achieved in the server market’s everyday life.<sup>111</sup> As a result, we acknowledge that a fuller specification of Windows APIs would be *important* for competitors, but not *essential* to carry on business. In other words, there are heavy doubts on the “essential nature” of the interface information contained in Windows 2000 server as well as in other server OSs marketed by Microsoft.

Secondly, Microsoft’s refusal to deal with rivals is objectively justified, in that it corresponds to a legitimate exercise of Microsoft’s intellectual property rights, namely its copyright on Windows source code. Microsoft’s refusal to disclose interface information is perfectly justified by its need not to offer its rivals the chance to take a wonderful free ride on information developed after gazillion investments in R&D. There is extensive caselaw on the opportunity of forcing market winners to disclose their intellectual property, including the famous *Kodak* and *Xerox* litigations.<sup>112</sup> The Commission allegation seems to fall short of what established by the most recent caselaw on refusal to deal with rivals, on both sides of the Atlantic. In the US, the recent Supreme Court decision in *Verizon v. Trinko*

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<sup>110</sup> Judgment in Joined Cases C-241/91 P and C-242/91 P, *RTE and ITP v Commission* (1995), ECR I-743; Judgment in Case C-7/97, *Bronner* (1998) ECR I-7791; Judgment in Case C-418/01, *IMS v NDC*, 29 April 2004.

<sup>111</sup> See *supra*, Section 2.4.1.2.

<sup>112</sup> See *Eastman Kodak Co. v. Image Technical Servs., Inc.*, 504 US 451 (1992); and *CSU v. Xerox*, 203 F.3d 1322 (Fed. Cir. 2000)

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significantly restricted the scope for alleging the anticompetitiveness of a dominant undertaking's refusal to aid competitors.<sup>113</sup> In the EU, the Court of Justice recently released its final decision in *IMS Health*, recalling that the three cumulative conditions listed in *Magill* and *Bronner* should be interpreted strictly, and that there must be at least a hypothetical secondary market in which the abusive conduct implemented by the defendant determines a foreclosure effect.<sup>114</sup>

Thirdly, Microsoft's refusal to supply information did not prevent the emergence of a new product. As a matter of fact, Sun and other competitors were not trying to market a newly developed software product. In other, simpler words, Microsoft's conduct created no bottleneck for the emergence of a new market, for which there was sufficient user demand: here, Microsoft rivals just wanted to ensure costless and perfect interoperability of their (already existing) products with Windows client OS.

Fourthly, Microsoft's conduct is certainly far from having determined a serious risk of foreclosing competitors from the relevant market. Market data confirm that most market players – in particular, Sun Microsystems – had performed quite well in terms of sales and profits over the timeframe under scrutiny. Most market players appeared quite healthy and far from considering exit from the market. As we already recalled, an observation of the normal practice in the relevant market reveals that most computer networks interconnect server OSs based on a number of different technologies, mixing open source software such as Linux with proprietary software such as Windows or NetWare. And again, most industry players are adopting a different business model, based on the cross-subsidization of core products with revenues from aftermarkets or from other bundled hardware/software, which appears as a powerful new mode of competition in the server industry.<sup>115</sup>

Finally, one should not neglect the difference existing between *Microsoft* and other cases in which a refusal to supply was challenged. Here, unlike what occurred in *Volvo*, *Magill*, *Bronner* and *IMS Health*, the contested conduct took place in the secondary market, not in the primary one. In

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<sup>113</sup> See *Verizon v. Trinko*, *supra* note 109. For an updated comment, see David S. Evans and A. Jorge Padilla, *Neo-Chicago Economics*, available online at <http://www.law.uchicago.edu/Lawecon/Antitrust/Evans-Padilla.pdf> (last visited: August 19, 2004).

<sup>114</sup> See *supra*, note 111.

<sup>115</sup> See *supra*, note 60. In particular, Sun Microsystems bundles the OS with hardware, such as its SPARC processor; IBM also bundles the Linux OS with its hardware, software and services. Finally, firms such as SuSe, Red Hat or Caldera bundle Linux with the provision of additional software and IT services.

other words, the essential information to be disclosed to rivals belongs specifically to the design of the server OS, a product that has countless rivals in its relevant market, however the latter is defined.

Many are therefore the questions that remain unsolved in *Microsoft*. In particular, as was authoritatively recalled in the immediate aftermath of the Commission's decision, it is still unclear whether Windows should be treated as an essential facility.<sup>116</sup> More importantly, is Windows server an essential facility? If not – as seems fair to conclude –, what is the ultimate aim of forcing Microsoft to disclose interface information and specifications mostly contained in its server OS, if not that of allowing for perfect emulation of Microsoft's copyrighted products?

### **3.1.4 Conclusion: full of bugs?**

The Commission's rationale seems to hinge on nebulous logical steps, when not on flawed economics. As we explained in this section, the Commission relied on an acrobatic market definition, on a degree of creativeness in the calculation of market shares, on a flawed interpretation of the technological leveraging doctrine, and finally on a misconceived application of the refusal to supply doctrine typically referred to essential facility holders.

What is left for us to stress is that the Commission ended up providing a shortsighted approach to the concept of interoperability. As a matter of fact, the Commission referred to the concept of "full interoperability" as implying a disclosure of Microsoft Windows' source code for most of the proceeding. In other words, amongst the existing solutions available to achieve interoperability between servers and clients based on different technologies (Web-based protocols, gateway servers, add-on client software, add-on server software), the Commission considered the "open Windows" solution as the only one providing for full client-to-server and server-to-server interoperability at no cost.<sup>117</sup> For this reason, the Commission initially stated its intention to force Microsoft to open up part of its source code to rivals. *"Microsoft should promptly make available ... all the interface information necessary to enable full interoperability ... such information being not less complete, less accurate nor less clearly presented than that which is available to Microsoft's employees... for the purpose of developing or improving*

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<sup>116</sup> See Giuliano Amato, *Some comments on Rudolph Peritz's and Roberto Pardolesi's view of the European Microsoft case*, available online at [www.law-economics.net](http://www.law-economics.net).

<sup>117</sup> See *supra* note 76 and accompanying text.

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*Microsoft Workgroup Server OS...*".<sup>118</sup> According to this view, interoperability means awareness of rivals' source code.

Even with the second Statement of Objections, the Commission clarified that Microsoft should not only disclose the information contained in the interfaces, but also the way in which it implemented such interfaces for the purpose of achieving full client-to-server and server-to-server interoperability.<sup>119</sup>

This interpretation seems to have been substantially reversed during the proceeding. Between the lines of the final Decision, no trace of the Commission's intention to force source code disclosure is left. What's more, the Commission clarified in several occasions that Microsoft's disclosure obligations should not be as far-reaching as to involve disclosure of Microsoft's specific implementation of its APIs. The magic word used by Monti's team to express this new, milder obligation is that of "specification", as opposed to "implementation". As a result, Microsoft is ordered to disclose interface specifications, but not its source code.

In conclusion, it is not clear where the line between information that Microsoft must disclose and information that Microsoft can avoid to disclose should be drawn. At first blush, it seems that the Commission's decision has not provided a significant contribution to the wording of the consent decree already signed between Microsoft and the US DoJ. Following that consent decree, as we recalled in Section 1, Microsoft started a Communication Protocol Licensing Programme, aimed at licensing at RAND conditions interface information needed "for the purpose of achieving interoperability" between Microsoft clients and non-Microsoft server OSs.<sup>120</sup> A closer look at the Commission's case suggests that Monti's team remained slave of its own mistakes in assessing Microsoft's alleged abusive conducts in the server OS market. And it is at once inevitable and quite embarrassing to conclude that Monti and his squad found no updated economic tools nor evident market facts that could reasonably lead to forcing Microsoft to disclose its own source code. For such reason, although the whole proceeding was characterized by heavy clouds on Microsoft's

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<sup>118</sup> See the First SO, *supra* note 20, at §367.

<sup>119</sup> See the Second SO, *supra* note 20, at footnote 230.

<sup>120</sup> Sure, the MCPP does not imply disclosure of information aimed at ensuring server-to-server interoperability. The Commission seems to consider this limitation as an obstacle to restoring the level-playing field in the server industry. However, as we already explained in this Section, neither a technological leveraging allegation nor an essential facility approach can support mandatory disclosure of interface information contained in Windows server OS, aimed at ensuring server-to-server interoperability.

future disclosure obligations, no rain finally came down on Redmond. The Commission clarified that “[t]he interfaces do not concern the Windows source code as this is not necessary to achieve the development of interoperable products. The interfaces are the hooks at the edge of the source code which allow one product to talk to another”<sup>121</sup>.

No doubt, the Commission’s decision might exert a substantial impact on the type of competition that will emerge in the industry in the coming years. As occurred in the US case, the mandatory disclosure of interface information will steer the market away from inter-system competition and lead it close to pure intra-system competition. This is good and bad news at the same time. It is good news because the Commission refrained from imposing disclosure of Windows source code, as seemed likely to be the case during the course of the proceeding. It is bad news because the features (no direct network externalities, no learning effects) and the recent evolution of the server industry (new business models, hardware/software bundling) suggested that inter-system competition could prove beneficial for long-run consumer welfare, without eliciting significant competitive concerns over the likely emergence and crystallization of dominant positions.

### **3.2 TECHNOLOGICAL INTEGRATION AND THE MEDIA PLAYERS WAR: LIVE AND LET TIE?**

Together with the refusal to supply allegation, the Commission also addressed Microsoft’s decision to integrate its media player software with its client operating system, Windows, alleging that Microsoft illegally harmed competition and stifled technological innovation by tying the sale of the two products. According to the Commission, Microsoft devised its technological tying strategy in order to preserve its applications barrier to entry in the client OS market.

Microsoft’s pricing strategy for Windows Media Player was also found to pose a serious risk of foreclosure. According to Microsoft’s competitors such as Real Networks, Microsoft was able to cross-subsidize its streaming media software in order to price below-cost and determine the exit of competitors from the market. As recently specified by Real Networks in its complaint to the US District Court, “Microsoft’s below-cost pricing ... poses

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<sup>121</sup> See Commission’s press release, 24 March 2004, available online at <http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/04/382&format=HTML&aged=0&language=EN&guiLanguage=en>. (last visited: August 19, 2004).

a serious probability of creating a monopoly in the digital media markets ... Microsoft can recoup its losses by later charging supra-competitive prices for its digital media products, or by later charging supra-competitive prices for operating systems with digital media bundled in".<sup>122</sup>

In what follows we address the approach adopted by the Commission regarding technological leveraging, in order to assess whether such approach is based on sound economic analysis. We first describe the main features of the relevant market, and then move to assessing the economic impact of Microsoft's peculiar integrated design on consumer welfare, competition and innovation.

### 3.2.1 The relevant market

In assessing Microsoft's conduct in marketing its Windows Media Player, the Commission defined the relevant market quite narrowly, by excluding software programmes that allow users to play audiovisual content, but not to stream media files. The Commission distinguished between downloading and streaming audiovisual content; and concluded that software programmes that allow for streaming media constitute a separate relevant market. We agree with the market definition adopted by the Commission, since there seems to be negligible demand-side and supply-side substitutability between media streaming software and media download software.

In the relevant market defined by the Commission, the most powerful players are Microsoft's Windows Media Player, Real Networks' Real Player and Apple's Quick Time. A number of other streaming media products hold a non-negligible market share – namely Nullsoft's Winamp, Music Match, Media Jukebox, Ashampoo and VLC Mediaplayer.<sup>123</sup> Yet, the Commission decided to exclude those media players from the relevant market, since they depend on third-parties' proprietary technologies, and as such – in the Commission's view – do not exert any competitive pressure on major players.<sup>124</sup>

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<sup>122</sup> See RealNetworks' Complaint and demand for Jury Trial, December 18, 2003, available at [http://seattletimes.nwsource.com/news/local/links/real\\_complaint1218.pdf](http://seattletimes.nwsource.com/news/local/links/real_complaint1218.pdf), §139 (last visited: August 19, 2004).

<sup>123</sup> See Commission's decision, *supra* note 2, at §§411 ff.

<sup>124</sup> "To the extent, therefore, that these media players depend on third parties' proprietary technologies, such as Microsoft's, for format support, they are not likely to constrain the third parties' behaviour". *Id.*, at §413.

The Commission's choice to exclude those other players from the relevant market is hardly understandable. In order to fully explain why such a perspective should not be endorsed, we need to get back to our discussion of system competition, as described in Section 2. Streaming media software is indeed part of a system, composed of three complementors.

### 3.2.1.1 *Media streaming software is a complementor*

Streaming involves breaking a file into small pieces or “packets” and sending them over a network. This process is controlled by specialized server software known as streaming media software. Before being streamed, content is digitized using formats known as “codecs”, which differ depending on the specific technology used, and is normally encrypted using DRM technologies, such as Windows Media Rights Manager, RealSystem Media Commerce Suite or Helix DRM. Methods to control that software packets are correctly transmitted and recomposed in the right order involve the use of protocols, which control also the way content is used on the streaming media device (for instance, how to send playback commands, pause commands etc.). Such protocols can be open (as is the case of IETF's Real Time Streaming Protocol) or proprietary (e.g. Microsoft's Media Server Protocol MMF). The protocols are executed by media streaming software installed on client PCs and running on client OS.

In summary, media streaming software is a complementor in a wider system. Such system has three main complementors: *a)* the streaming media server software; *b)* the client streaming media software; and *c)* the formats or codecs supported by those players. All three complementors must be compatible in order for one media streaming system to be used. Existing systems exhibit different architectures, which allow for inter-system and intra-system competition. The three major players in the relevant market use incompatible formats – i.e., content that is digitized according to, say, Microsoft's format cannot be read by Apple's software. The other players compete in the streaming media market with major players, but rely on third-parties' technologies for other complementors. In particular, software such as MusicMatch Jukebox, Winamp and Ashampoo support several formats, including Microsoft's WMA format. Other products do not support Microsoft's format, but support MPEG and DivX codecs.<sup>125</sup>

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<sup>125</sup> In particular, the Commission specifies that “MusicMatch Jukebox, for example, licenses and relies on the Windows Media codec and also supports MPEG formats. Winamp supports MP3, WAV and Microsoft's WMA format (Winamp does not support RealNetworks. formats). The VLC

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A careful observation of the streaming media market reveals that three alternative integrated systems compete on this market, while allowing for third-party reliance on their interface specifications. In other words, the market is characterized by both inter-system and intra-system competition. From this standpoint, there seems to be no particular reason for the Commission to exclude intra-system competitors from the relevant market.

What will be the effect of this particular market environment on competitive dynamics? As we explained in Section 2, in case the sector is dominated by a closed system, in which all three complementors are proprietary and marketed by the same firm, there will be only space for inter-system competition. Alternatively, in case some (but not all) complementors are based on open technologies and are selectively disclosed to a limited number of operators, a degree of intra-system competition will be observed. Finally, if all three complementors are based on technologies fully disclosed to the public, competitors will be able to enter the market by perfectly emulating existing products.

In other words, the type of system architecture chosen by industry players affects the type of competition that will be observed in the market, as well as the level of entry barriers for would-be entrants. In particular, Microsoft chose to market a semi-open streaming media system. In case its technology comes to dominate the market, new entrants would face a trade-off: either they enter the streaming media software market by relying on Microsoft's technologies in other complementors (intra-system competition), or they will have to develop a fully integrated system and engage in inter-system competition, by trying to market a higher-quality product and conquer market shares with it.

The welfare effects of an inter-system competitive environment vis-à-vis intra-system competition depend on the relative weight of direct and indirect network effects as well as learning effects. As we already explained in Section 2, if both network and learning effects are significant, there is a risk that the market will tip towards the emergence of a single standard technology, and that such technology will constantly enjoy a substantial competitive advantage over rival ones. This situation might end up stifling innovation, to the detriment of consumer welfare. At the other extreme, whenever neither network nor learning effects occur, inter-system competition is a viable competitive environment, just as happens in all

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Mediaplayer supports, for example, MPEG and DivX codecs. Ashampoo distributes the Ashampoo Media Player, which is based on Windows and plays 'over twenty file formats' (including Windows Media formats, MP3, and Ogg Vorbis)." *Id.*, at §412.



traditional markets. For instance, we usually do not complain because engines installed on Mercedes cars are not fully interoperable with BMWs. And this happens because the availability of a large number of competing engines is normally not a driver of consumer demand in the choice of a car – i.e., cars are system goods but not a two-sided market.

All other situations are hybrid – inter-system competition might prove preferable to intra-system competition absent significant network or learning effects, but intra-system competition might be more reassuring, from the standpoint of consumer welfare in the long run, if learning effects are not overwhelming. To be sure, the Commission expressed the concern that the ubiquity of Microsoft WMP on end users’ desktops will lead the market to tip towards Microsoft’s technology. Moreover, the Commission is worried that, once the market has tipped, Microsoft will start charging supracompetitive prices and gradually lower the quality of its product.<sup>126</sup>

We question this approach in its two pillars. First, we doubt that the market is inevitably doomed to tipping, and doubt that tipping is a disdainful perspective for the streaming media software market. Secondly, Microsoft might be able to start charging excessive prices and lower the quality of its product only if it starts denying interface information to those competitors that as of now engage in system competition. But this will not be possible, since Microsoft already committed to disclose such information at RAND conditions under the consent decree signed with the US government.<sup>127</sup>

### 3.2.1.2 *Will the streaming media market tip?*

The Commission explained – and Real Networks stated also in the US – that the market for streaming media is characterized by strong network effects, and that – for such reason – sooner or later one technology will “tip” and will quickly become the one and only technology available to end users.<sup>128</sup> However, there are many reasons that elicit some doubts on the likelihood that this market will tip, with harmful effects for end users.

First, streaming media software, unlike downloads, do not exhibit direct network effects. End users will never share with other users the

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<sup>126</sup> In one of its Statements of Objection, the Commission even expressed the concern that Microsoft could gradually lower the quality of its product once the market has tipped, by enabling only low bitrates and preventing its media player from streaming CD-quality content.

<sup>127</sup> Note that streaming media software exposes APIs and is therefore classified as middleware. As such, it is covered by the provisions of the US Consent decree. See *supra*, Section 1.1.

<sup>128</sup> As stated by the Commission, “The network effects characterising the media software markets ... translate into entry barriers for new entrants”. Commission’s decision, *supra* note 2, at §420.

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audiovisual content they enjoy on their client PCs. Streaming media are a one-way network, not a two-way one, and entail narrowcasting content, not downloading and sharing.<sup>129</sup> As a result, the virtual network of media streaming does not exhibit the virtuous features that economists tribute to two-way or *e2e* virtual networks, including the so-called Metcalfe's law, according to which the value of a network grows exponentially as the number of its users grows linearly; and the outward shift in the demand curve we described in Figure 2 will not materialize in this market.<sup>130</sup>

No doubt, the streaming media market might exhibit, to a certain extent, indirect network effects, stemming from the middleware nature of media player software. Media player producers know that they have to get two different categories of users "on board". On the one hand, content producers will choose to digitize their audiovisual content in one player's format as the ubiquity and popularity of such players grows. If a media player is not sufficiently widespread, content producers will not decide to associate their content with its format. After all, adapting the same content to different formats is costly, and this might spur the emergence of a single technology. But within this technology, all competing producers of streaming media software will profit from the success of the platform. To the extent that sufficient intra-system competition is preserved, there should be no particular source of concern for consumer welfare. The only negative effect related to this scenario is the loss of technological heterogeneity in the market. But the Commission does not seem particularly worried about this issue – to the contrary, it is imposing *de facto* technological standardization in the server OS industry.

Finally, learning effects do not seem to be an issue in the market for streaming media software. Users know very well how to use the products, whose graphical user interface closely resembles old-style tape recorders. As a result, users that decide to switch to another media player would face no significant switching costs. The only problem is that – if they switch to an entirely new technology – they might find less content available for the new media format. On the other hand, if users switch to an intra-system competitor, they will be able to stream the same content, but using a different software.

In summary, the relevant market does not appear doomed to tipping, for the absence of both direct network effects and learning effects. Indirect

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<sup>129</sup> On the difference between unidirectional (one-way) and multidirectional (two-ways) networks, see Pardolesi and Renda, *supra* note 46, note 28 and accompanying text.

<sup>130</sup> On Metcalfe's law, see *supra* note 46 and accompanying text.

network effects might, to a certain extent, raise a barrier to entry for new industry players, in case such players want to engage in inter-system competition. However, if sufficient intra-system competition is preserved in the market – as should be the case after Microsoft signed the US consent decree –, no particular competitive advantage would be enjoyed by WMP over competing players that use the same technology.

### **3.2.2 Microsoft’s conduct in the relevant market, its underlying strategy and its effects**

In the Commission’s view, Microsoft tied the sale of Windows with that of its WMP for two main reasons. First, Microsoft aimed at monopolizing the media player market, which is a growing and increasingly strategic sector. Secondly, Microsoft illegally attempted to preserve its paramount position in the client OS market, by shielding its Windows OS from the competitive threat of emerging middleware such as media streaming software.

As regards monopolization of the streaming media player market, such goal would be achieved only if Microsoft could eliminate all inter-system and intra-system competitors. According to the Commission, Microsoft could succeed in such an attempt, since it controlled the most attractive distribution channel for streaming media software, the OEM channel.<sup>131</sup>

How could Microsoft achieve control over the OEM channel? The answer is simple, and closely recalls arguments fully explored during the US case. According to competition authorities on both sides of the Atlantic, Microsoft upholds technological integration of different products as a strategy aimed at achieving desktop ubiquity for its middleware products, hence protecting its paramount position in the client OS market. Accordingly, just as it did with its Internet Explorer, integrated into Windows 98, Microsoft commingled the source code of Windows Media Player with that of Windows 98 (Second Edition), starting on May, 1999. Microsoft then kept following this strategy for subsequent versions of Windows and WMP.<sup>132</sup>

By endorsing a code-commingling strategy, Microsoft was allegedly able to force OEMs to purchase Windows – a de facto industry standard that inevitably drives end users’ demand – together with its added streaming

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<sup>131</sup> After stating that “tying Windows Media Player affords Microsoft unmatched ubiquity on client PCs worldwide” (§§843-848), the Commission specifies that neither installation agreements with OEMs (§§849-857), nor downloading (§§858-871) can offset such ubiquity. Also other available distribution channels are found to be second-best (§§872-876).

<sup>132</sup> See Commission’s decision, *supra* note 2, at §909.

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media functionality. As a result, OEMs do not have the possibility to choose whether to pre-install Windows without WMP in their computers. End users will inevitably find WMP pre-installed on their PCs, and will have little or no incentive to switch to competing products.

In our opinion, the Commission's conclusion that Microsoft has illegally tied WMP with Windows 98 and subsequent versions lays on quite shaky foundations. As a matter of fact, as recalled by the Commission, an anticompetitive tying under Article 82 of the EC Treaty requires the following evidence: a) the tying and tied goods must be two separate products; b) the undertaking concerned is dominant in the tying product market; c) the undertaking concerned does not give customers a choice to obtain the tying product without the tied product; and d) the alleged tying forecloses competition.<sup>133</sup> No doubt, Microsoft is dominant in the tying market and does not give customers a choice of obtaining the tying product without the tied product. And we can concede that streaming media software has sufficient stand-alone customer demand to be defined as a separate product from the Windows OS.<sup>134</sup> But the foreclosure effect of Microsoft's conduct on competition is very hard to detect and prove.

In order to state that Microsoft could foreclose competition by commingling the code of Windows and WMP, the Commission should have provided reasonable evidence. In particular, we question that Microsoft could effectively rule competitors out of the relevant market just by controlling the OEM distribution channel. There are indeed many alternative channels available to competitors wishing to bring their streaming media software to market. The most common of these channels is certainly direct download from the Web.<sup>135</sup> With modern, widespread high-speed Internet connections, streaming media software takes three minutes to download. And most users, as confirmed by the Commission, keep more than one streaming media product on their PCs, since these middleware products require only negligible space on the hard disk - more and more negligible as the cost of memory storage becomes lower and lower overtime.

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<sup>133</sup> *Id.*, at §794. For an analysis of the US and EU competition authorities' approach to tying, see Ahlborn, Evans and Padilla, *The Antitrust Economics of Tying*, *supra* note 12.

<sup>134</sup> See Larry Lessig's proposed test for applying *Jefferson Parish* to tying cases in the software industry, in his Brief as Amicus Curiae in the US Microsoft case, February 1, 2000, available at [http://jurist.law.pitt.edu/amicus/us\\_v\\_microsoft\\_lessig.pdf](http://jurist.law.pitt.edu/amicus/us_v_microsoft_lessig.pdf). (last visited: August 19, 2004).

<sup>135</sup> Other distribution channels include bundling of streaming media software with other software or Internet access services and - less importantly - retail sales. See the Commission's decision, *supra* note 2, at §§872-876.

Moreover, the parallelism between the browser integration and the media player integration should not lead to a full analogy between the two cases. Recall that, unlike Internet browsers, existing media players support different formats. The real driver of end users' demand is then content, much more than ready-to-use integrated code. If users want to stream a particular audiovisual file, they will be asked whether they already installed the specific software needed for streaming that file. If this is not the case, users will be able to easily download the software from the Web and then the streaming will become possible; in fact, several millions of users ended up with more than one streaming media software after following these steps. Commercial agreements between producers of streaming media players and content producers are therefore a key driver for media players' commercial success. And over the past few years, leading producers such as Real Networks have signed lots of these strategically crucial exclusive agreements with many important content producers – such as America On Line, Virgin Records, BMG, ABC, CBS and many others.<sup>136</sup>

As a result, it is fairly difficult to imagine that Microsoft's conduct could have the effect of determining competitors' exit from the relevant market. Accordingly, we disagree with statements recently made by Microsoft's fiercest competitor, Real Networks, that “[a]vailable methods of distribution are not a fully effective substitute for preinstallation by PC makers.”<sup>137</sup>

One possible source of foreclosure put forward by Real Networks is the double cost OEMs would face in case they decide to pre-install more than one media player on their PCs, as well as the double cost end user would face in case they decide to install *ex post* a second media player. As far as the latter issue is concerned, we already pointed out that such additional cost is negligible in the case of media players, given the ease of download and automatic installation of these products. For what concerns additional support costs faced by OEMs that decide to pre-install a competing media player, the magnitude of the problem seems at best negligible if compared with the homologous issue raised for the browsers war in the US. As a

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<sup>136</sup> Many examples of important commercial agreements signed by RealNetworks are found directly on the firm's pressroom at <http://www.realnetworks.com/company/press/releases/>.

<sup>137</sup> See RealNetworks US Complaint, *supra* note 123: “For example, offering software for downloading has difficulties and costs. Many customers who begin to download software give up before the download completes. ... of those people who succeed in downloading the entire file, many will never install the software. Furthermore, businesses often preclude employees from downloading and installing software”. *Id.*, at §165.

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matter of fact, the majority of audiovisual content available on the Web is in Real Player format, and such a circumstance provides OEMs with more than sufficient incentives to decide to install Real Player. Furthermore, Real Player has exploited such a competitive advantage by negotiating contracts with major OEMs and with the leading motherboard producer, Intel, under which PCs will come bundled with RealPlayer software.<sup>138</sup> More recently, Red Hat and SuSe announced that their respective Linux distributions will come bundled with RealNetworks' Real Player and Helix Player. Such an agreement will soon lead to the marketing of a Real Player 10 for Linux.<sup>139</sup> Sure, Microsoft could try to achieve a competitive advantage by granting favourable license conditions to those OEMs that decide not to promote competing media players. But this problem has already been tackled by the US consent decree, as we explained in Section 1.1.

Notwithstanding the patent difference between the browsers war and the media player war, the Commission stated that the OEM channel must be considered as an unrivalled means of distributing streaming media software, and that control over this distribution channel leads to foreclosure of competitors from the market. Alternative distribution systems, concluded the Commission, "do not enable media players competing with WMP to match the ubiquitous and guaranteed presence of the pre-installed WMP code on client PCs worldwide."<sup>140</sup>

### 3.2.2.1 *Some law and economics of technological integration*

Even if Microsoft's conduct is found to satisfy the four-step screen normally applied by the European Commission in order to detect anticompetitive tying, we must live with the fact that technological integration is quite different from standard tying.<sup>141</sup> In other words, in most

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<sup>138</sup>See *Real Networks Snags Intel Distribution Deal*, May 30, 2001, on News.com, at [http://news.com.com/RealNetworks+snags+Intel+distribution+deal/2100-1023\\_3-264197.html](http://news.com.com/RealNetworks+snags+Intel+distribution+deal/2100-1023_3-264197.html) (last visited: August 19, 2004).

<sup>139</sup> See, e.g., Phil Hochmuth, *Real wants to be 'the' media player for Linux*, Network World Linux Newsletter, 07/07/04, at <http://www.nwfusion.com/newsletters/linux/2004/0705linux2.html>. (last visited: August 19, 2004).

<sup>140</sup> See Commission's decision, *supra* note 2, at §877.

<sup>141</sup> As is widely known, economists from the Chicago School rejected the idea that tying could facilitate the leveraging of a firm's monopoly position in the tying market, allowing it to profitably monopolize the tied market. The so-called post-Chicago economics, however, challenged this "single monopoly profit" theorem, showing that the unprofitability of monopoly leveraging holds only under rather restrictive conditions. (In particular, Professor Michael Whinston produced a model showing that the Chicago School critique of leveraging theory only applies when the tied market is *perfectly* competitive. In his model, tying commits the monopolist to being more aggressive than the entrant, and this commitment discourages entry. Professor

cases technological integration was found to create more appealing and efficient products, therefore enhancing consumer welfare. For such reason, US courts have gradually abandoned the *per se rule* approach normally adopted for tying claims, and upheld a more careful rule of reason approach, aimed at ascertaining whether the integrated product is more valuable to end users than the sum of its parts.<sup>142</sup>

The rule of reason approach adopted by the Court of Appeals in *Microsoft III* is the result of a long debate in the US law and economics literature. US courts have realized the importance of technological defences to technological tying allegations since *IBM v. Telex Co.*, and have developed a significant degree of deference with respect to peculiar choices of technological design that determine the integration of two complementors.<sup>143</sup> In *Innovation Data Processing v. IBM*, the court found that IBM had not violated antitrust rules since, “rather than constituting an illegal tying arrangement, [the integration] instead constitute[d] ... a lawful package of technologically interrelated components.”<sup>144</sup> As we already recalled, the Consent decree signed by Microsoft and the DoJ in 1994 already left Microsoft with the freedom to design its OS with add-on functionalities, and the D.C. Circuit in *Microsoft I* concluded that, “when ...

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Whinston shows that tying could be used to deter entry into, and thereby monopolize, the tied product market if (1) the selling firm is a monopolist in the tying product market, (2) the tied product market has decreasing average costs over the relevant range of output, and (3) the tied and tying products are used in variable proportions. Whinston finds, however, that the predicted welfare effects of even that specialized case of tying are ambiguous. See Ahlborn, Evans and Padilla, *supra* note 12; and J. Gregory Sidak, *An Antitrust Rule for Software Integration*, available at [www.criterioneconomics.com/docs/SidakSoftwareArticle.pdf](http://www.criterioneconomics.com/docs/SidakSoftwareArticle.pdf)). During the US Microsoft case, even authoritative advocates of free software recognized that software integration can in most cases prove beneficial for end users. And a careful application of sound economic theory supports the “narrow and deferential approach” adopted by US Courts in dealing with technological integration. See *infra*, note 144.

<sup>142</sup> See Ahlborn, Evans and Padilla, *supra* note 12.

<sup>143</sup> See *Telex Corp. v. IBM*, 367 F. Supp. 258, 342 (N.D. Okla. 1973) (holding that if the new product was technologically superior than the original product, then it is beyond the scope of antitrust laws); see also *Response of Carolina, Inc. v. Leasco Response, Inc.*, 537 F.2d 1307, 1330 (5th Cir. 1976) (noting that if a product is designed based on technological superiority, and not for anticompetitive purposes, then it would pass muster under antitrust laws); *In re Data Gen. Corp. Antitrust Litig.*, 490 F. Supp. 1089, 1109 (N.D. Cal. 1980) (ruling that any design that is cheaper for the consumer may evade liability under antitrust laws); *Foremost Pro Color v. Eastman Kodak Co.*, 703 F.2d 534, 542 (9th Cir. 1983) (rejecting a rule of finding a *per se* tying arrangement on the basis of design alone); *Innovation Data Processing v. IBM*, 585 F. Supp. 1470, 1476 (D.N.J. 1984) (holding that technological reasons for integration were lawful under antitrust laws); and even *Microsoft I*, 147 F.3d 935, 949-50 (D.C. Cir. 1998) (“A court’s evaluation of a claim of integration must be narrow and deferential.”).

<sup>144</sup> See *Innovation Data Processing v. IBM*, 585 F. Supp. 1470, 1471-73 (D.N.J. 1984), at 1476.

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combined”, Windows and IE constituted a single product.<sup>145</sup> The D.C. Circuit in this case essentially created “a rule of *per se* legality for products characterized as integrated”<sup>146</sup>, pointing to products that combine “functionalities (which may also be marketed separately and operated together) in a way that offers advantages unavailable if the functionalities are bought separately and combined by the purchaser.”<sup>147</sup> This means that the courts will have to carry out a two-pronged test: (1) the combination “must be different from what the purchaser could create from the separate products on his own,” and (2) the combined form must “be better in some respect.”<sup>148</sup>

Now, is the combination of Windows and WMP an integrated product under this approach? The answer depends on whether the combination of the two products is worth to end-users more than the sum of its two parts. No doubt, software vendors can assemble the OS and the media player more efficiently than the average end user. But also OEMs can perform such task efficiently. The crucial question is then whether software vendors can integrate products more efficiently than OEMs. In order to answer this question, we need to explore the possible efficiencies stemming from code commingling. As far as the Windows-IE combination is concerned, the possibility of using the desktop as a Web page through Active Desktop and the rationalization of disk space through Windows Installer were two examples of added functionalities that could be achieved only through code-commingling. In the case at hand, the virtues of integration might be less evident. However, the problem is that the Commission did not even address the issue of potential efficiencies arising from technological integration of the operating system and a streaming media player. In case it turned out that consumers could derive a higher utility from having the software vendor assemble the two products (instead of leaving this task to OEMs or having to cope with it by themselves), the Commission would have to take into account such potential efficiency and balance it with other sources of inefficiency related to potential (and, to tell the truth, hardly detectable) foreclosure effects.

In other words, the Commission has never directly addressed the problem of consumer harm in assessing the competitive impact of Microsoft’s

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<sup>145</sup> See *Microsoft I*, 980 F. Supp. 537, 540-41 (D.D.C. 1997), *rev’d*, 147 F.3d 935 (D.C. Cir. 1998), at 544.

<sup>146</sup> See, e.g., John E. Lopatka & William H. Page, *Antitrust On Internet Time: Microsoft and the Law and Economics of Exclusion*, 7 SUP. CT. ECON. REV. 157, 198 (1999).

<sup>147</sup> See *Microsoft I*, *supra* note 146, at §948.

<sup>148</sup> *Id.*, at 949.



conduct in the streaming media market. Authoritative commentators have recently denounced an increasing attitude towards neglecting the issue of consumer harm in antitrust policy, and considered the weaker, “edentulous” consumer harm standard adopted in cases like *Intel*, *Microsoft* or *Visa* to represent “economically unsound policy”.<sup>149</sup> Such attitude dangerously brings the Commission back to the resounding *j’accuse* moved by US commentators and policy enforcers in the aftermath of the *GE/Honeywell* decision: that the Commission ends up “protecting competitors, not competition”.<sup>150</sup>

Economists have also clearly pointed out that technological integration should be treated differently from traditional tying allegations by competition authorities. Under the Chicago school approach, economists have gradually acknowledged that tying can exert in most cases a beneficial impact on consumers. First, a technological tie-in can lead to beneficial removal of the deadweight loss, by allowing better price-discrimination. Secondly, tying can reduce consumer risk. Thirdly, tying can in most cases respond to a need to control the quality of a system good. And, whereas traditional tie-ins can be seen as anticompetitive when they impose additional costs on consumers, software integration normally does not impose any additional charge on end users, since the tied product is in most cases priced at zero, *i.e.* in line with the marginal cost of most software products. This was the case for Microsoft’s tie-in of Internet Explorer with Windows, and is the case for Microsoft’s decision to integrate Windows with WMP.

In summary, US enforcers, lawyers and economists have gradually reached the conclusion that technological tying deserves a more relaxed approach when subject to antitrust scrutiny, and certainly should be freed from the *per se* rule. The European Commission seems to have completely neglected the premises and underpinnings of such a twenty-year-long debate. Had the Commission applied sound economic theory, we doubt that unbundling of the media player would have reaped such a wide consensus in Brussels.

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<sup>149</sup> See Howard H. Chang, David S. Evans and Richard Schmalensee, *Has the Consumer Standard Lost its Teeth?*, in Robert Hahn (Ed.), *High-Stakes Antitrust. The Last Hurrah?*, AEI-Brookings Joint Center for Regulatory Studies, 2003, 72-116.

<sup>150</sup> See, *e.g.* A. Jorge Padilla and Andrea Renda, *Conglomerate Mergers, Consumer Goods and the ‘Efficiency Offense’ Doctrine*, available online at [www.law-economics.net](http://www.law-economics.net).

3.2.2.2 *The effects of Microsoft's conduct on rival players*

The alleged harmful effects suffered by Microsoft's rivals consist in a likely foreclosure from the relevant market, once the market has tipped towards a single (Microsoft) *de facto* standard. According to Real Networks, Microsoft's technological tying strategy leads to a number of undesirable effects: in the US, Real Networks has recently stated that Microsoft precluded OEMs from undertaking a number of initiatives, such as: a) changing the status and configuration of WMP, b) promoting rival players' subscription services during the first run of a new PC, c) preloading music files encoded in alternative formats in the "My Music" Windows folder (where Microsoft preloads Windows Media Files), d) making any player other than the Windows Media Player the default player for many video and audio formats "preassigned" to WMP; e) honoring contractual promises to promote rivals' subscription services during the introductory boot-up; f) giving rival players an agreed upon placement in the Start Menu of the PC; g) configuring PCs to run a rival utility to protect the consumer's choice of default digital media player; h) preinstalling applications as "Start-up" applications; i) placing rival icons in the System Tray of their computers; j) including a hyperlink to allow users to register for rival players' subscription during the initial registration sequence; k) placing other media players in the Most Recently Used menu; and l) providing a desktop icon for rival media players.<sup>151</sup>

We do not question that such effects actually materialized in the relevant market. However, it seems quite clear that the real source of such a foreclosure effect is not Microsoft's technological integration of the OS and the streaming media player, but Microsoft's contractual behaviour. And if one carefully looks at the prescription contained in the consent decree signed by Microsoft and the DoJ and entered by District Judge Kollar-Kotelly in November 2002, it becomes crystal clear that Microsoft's commitments under such decree are sufficient to eliminate all these problems. Once OEMs will enjoy the freedom to promote rival players and change the boot-up procedure, no such foreclosure effect will arise.

Furthermore, note that our discussion of foreclosure effects does not change if one takes into account the likelihood that the market will tip. Even if the market ends up tipping towards a single *de facto* standard technology, end users will profit from standardization and from intra-

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<sup>151</sup> See RealNetworks' complaint, *supra* note 123, at §163.

system competition, which allegedly will prevent Microsoft from charging supracompetitive prices and fall into irreversible  $x$ -inefficiency.

### 3.2.3 Approaching the Pareto-pessimism

The European Commission's allegation that Microsoft harmed competition and stifled innovation by monopolizing the streaming media player market through technological tying is not supported by sound economic theory. The Commission did not have the chance to deal with technological integration in previous cases, and showed all its *impasse* in dealing with the peculiar dynamics of system competition under (indirect) network effects.

Our discussion of the case at hand suggests that a ready solution was already available to European trustbusters – the US consent decree allows for easy intra-system competition without forcing Microsoft to remove an otherwise beneficial integrated design. Under the US solution, OEMs would be able to market competing players “on top of” Microsoft's Windows/WMP bundle. What is most worrying is that the Commission has lost sight of consumer harm, has not satisfactorily proven foreclosure effects, and has treated technological integration exactly as an old-fashioned tying claim.

The solution devised by the European Commission, in synthesis, will produce harmful effects in many respects. First, Microsoft will be harmed, since it will have to invest new resources in unbundling its OS and media player. Secondly, all industry operators might be harmed by the Commission's approach, since the choice of a semi-open architecture for system goods will become hardly workable. Thirdly, end users will lose the benefits of software integration. In other words, all industry players will be probably worse-off once such a solution is endorsed, but for the short-run benefit of the plaintiffs. And this situation closely resembles that of a “Pareto-pessimism”.

## CONCLUSION: WHO PROTECTS COMPETITION FROM COMPETITION POLICY?

Competition policy, as we normally observe it, is all about using proxies. Economists acknowledge it quite easily. Since reality is often too complex for a policymaker to take into account all relevant variables, economic theory normally looks with favor at intermediate goals that allegedly steer the market economy towards welfare-enhancing equilibria. In the case of competition policy, a sufficiently competitive market environment is

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normally considered as a proxy for the maximization of consumer welfare. And consumer welfare is normally held as an approximation of social welfare. A high market share is normally considered as a proxy for dominance, as well as pricing over marginal costs is normally termed “supracompetitive” and deemed as welfare-decreasing.

So far, so good. But as far as proxies are concerned, competition policy enforcers diverge on whether the actual existence of a sufficient number of competitors should be deemed as a valuable proxy for the maximization of consumer and (consequently) social welfare. The EU authorities seem to hinge more often on such a “structuralist” approach to competition policy, if compared to the US enforcers. And this view – which, according to many commentators, is inherited from the Ordoliberal school that inspired the economic spirit of the EC Treaty – is often criticized by the US enforcers, especially as far as merger control is concerned, but also in dominance cases.<sup>152</sup>

The divergence between the US and EU approaches to competition policy becomes even more evident if we consider that some of the proxies typically used by competition authorities in the application of competition law do not necessarily perform well in some industries. A telling example is provided by the complex world of high-tech, knowledge-based industries, which commentators normally define as “new economy”, “information economy” or “digital capitalism”. In these contexts, the market mechanism seldom plays the role of optimal resource allocator, the price level conveys scanty information to consumers, marginal costs and quantity restrictions simply do not exist, market shares normally make little or no sense, and a constant overlapping of one-generation monopolists is often preferable to mere competition *in* the market. As is understandable, competition authorities, in such dynamic environments, often lose orientation.

An important consequence of such an *impasse* was the fall – though paradoxically dressed, in *ex post* public statements, as intransigent defense – of the consumer harm standard as one of the pillars of competition authorities’ rationale when sanctioning allegedly anticompetitive conducts.<sup>153</sup> In the past few years, competition authorities on both sides of the Atlantic have started attaching higher value to the so-called harm to the

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<sup>152</sup> See, e.g. A. Jorge Padilla and Andrea Renda, *supra* note 151.

<sup>153</sup> In several occasions, Monti recalled that in the Commission’s view “the consumer is king”. See *i.a.* Monti’s speech, *Antitrust in US and Europe: a History of Convergence*, General Counsel Roundtable, American Bar Association (ABA) Washington, DC November 14, 2001.

“competitive process” as a new proxy for harm to consumers. In many cases – most notably, *Intel*, *Visa* and *Microsoft* – such view has led to decisions that appeared at times “eccentric” if analyzed under the litmus test of economic theory.<sup>154</sup>

In the EU, the stronger emphasis on market structure has led to a gradual overlapping of harm to competition with harm to competitors, with inevitably disastrous consequences. Such a decline of the structuralist approach explains why, in dealing with dynamic knowledge-based industries, the EU competition authorities have exhibited a more worrying lack of confidence than their homologous on the other side of the Atlantic.

Accordingly, the Microsoft case, once more, deserves attention also for reasons other than the mere settlement of the opposing interests at stake. Our analysis has shown that the Commission followed a rather unconvincing path in dealing with Microsoft’s alleged “wielding of monopolistic leverage” – an issue known to modern antitrust enforcers since *Times-Picayune*, *Xerox* and *Kodak*, but that in the workgroup server OS market exhibits brand new features – and ended up building an impressive mountain of allegations, which only gave birth to a mouse. Moreover, the Commission adopted an outdated approach to software integration, leaving media player vendors with a hardly acceptable solution.

Of course, this is not the end of the story. The Court of Justice will certainly scrutinize with zeal the allegations put forward by the Commission in the final decision. And the coming years will hopefully mark a stronger emphasis on economically sound antitrust rationales. Yet, one conclusion can already be drawn. Those who considered the traditional instrumentarium of competition policy to be adequately equipped for coping with the new challenges posed by the Internet age should probably acknowledge that competition authorities are in desperate urge for new economic tools. Only economically sound competition policy can protect dynamic competition from the unpredictable underpinnings of competition policymaking.<sup>155</sup> And this is yet another reason for considering the Microsoft saga as an all-time milestone for the many fallacies of European trustbusters.

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<sup>154</sup> See Chang, Evans and Schmalensee, *Has the Consumer Harm Standard Lost its Teeth?*, *supra* note 150.

<sup>155</sup> “Mistaken inferences and the resulting false condemnations are especially costly, because they chill the very conduct the antitrust laws are designed to protect.” *Verizon v. Trinko*, *supra* note 109, 882.