



1. Competition analysis in high innovation markets is an area of growing importance, as evidenced

6. The Secretariat's Issues Paper asks about "the general advisability of working out special

innovation markets. It sometimes is appropriate to do so, but not always. In some cases, pre- and post-merger concentration levels are useful pre-merger indicators of a transaction's possible effect on competition, even in high innovation markets.



perhaps most importantly, the customer bases of iMCI and UUNET, the two top backbone providers. The combined entity would have been by far the largest single nation-wide backbone and Internet connectivity provider with an overall majority of customers (web sites, ISPs, and dedicated access corporate customers) connected to the Internet. Post-merger market shares for Internet connectivity ranged from 40-75%, depending on what measure of market share was used.<sup>27</sup>

20. In addition to a concern that the merger would facilitate tacit collusion, the DOJ was concerned about what effect it would have on the existing network. Prior to the MCI/WorldCom merger, no single backbone provider reached a disproportionate amount of destinations on the Internet relative to other major players. There was a rough equality, with each backbone provider depending on the other. Each backbone provider, therefore, had an incentive to support efficient interconnections because its failure to do so would have caused such a degradation of quality that it risked losing customers to the other networks. That incentive would change, however, if the two largest backbone providers were combined. But the MCI/WorldCom merger threatened to create a very large network with a huge size disparity. By representing a majority of the Internet customers, MCI/WorldCom would have been more valuable and been more important as a point of interconnection for other Internet providers, which would otherwise lose access to a great deal of the Internet. MCI/WorldCom would have far less need to depend on the other backbones than those backbones would have to depend on it. By giving MCI/WorldCom a disproportionately large customer base, the merger would have changed MCI/WorldCom's incentives from favouring compatibility toward favouring incompatibility. Recognising this, there was widespread industry concern about the effects of the merger on peering arrangements and on interconnection prices.

21. MCI/WorldCom's changed incentives would have increased the likelihood that it would attempt to tip the market by charging existing peers for interconnection or by degrading the quality of interconnections. MCI/WorldCom would have been able to do this, either through unilateral action, or through collusion with the only remaining player with a significant market share. The disproportionate dependence that other backbones would have had on MCI/WorldCom would have given it bargaining leverage to dictate the pricing and terms of interconnection. MCI/WorldCom could have begun charging peers for interconnection to its network, either all at once or on an individual peer-by-peer basis (by picking off the smallest rivals first), raising the costs of its rivals. MCI/WorldCom then could have chosen either to raise its own prices with that of its rivals, or to keep its price lower and let the market tip towards it, possibly leading to monopoly control of the Internet. Or MCI/WorldCom could have degraded the quality of its competitor's interconnections to its network. It could have done this either actively or passively, by not investing in the interconnections needed to keep up with the massive growth, and it could have done this either to all competitors or on an individual basis. Interconnection points are constantly upgraded to keep up with the exponential growth of Internet traffic; any slowdown in the upgrading of these points would have serious effects on the quality of the connection. While this strategy would lower the quality of service for all networks, rivals' networks would suffer more degradation, allowing MCI/WorldCom either to increase its own prices, reflecting its better quality, or to gain market share. Again, with this strategy the market could have tipped to MCI/WorldCom, giving it monopoly control of the Internet. Under either



free up resources to be used for R&D. Combining innovators also may be beneficial when either the different innovation strategies being pursued are complementary, so that a combination of the two would



as having a greater ability to finance R&D. It is also more bureaucratic and stable. To utilise fully its

monopolize the capacity to innovate,<sup>39</sup> and that product and technology markets are sufficient to deal with concerns relating to loss of R&D competition.<sup>40</sup>

39. Rapp correctly points out that a crucial aspect of innovation market analysis is the identification of the specialised assets or characteristics needed to compete successfully in the market, and the firms that possess them. His criticism is that the antitrust agencies have not articulated a “policy” to guide the analysis so that it is predictable.<sup>41</sup> Specialised assets will vary across industries, of course, but the essential analytical criterion is that the specialised assets or characteristics be reliably identified. Examples include key physical assets, experience, production ability, and, as in many high-tech industries, intellectual property. Whether any such assets are needed in a particular market requires a case-specific analysis, but the inquiry is relatively straight-forward. That is not to suggest that the analysis is necessarily easy. It is difficult to predict, for example, whether innovative, market-transforming entry might come from firms currently engaged in a different market. That possibility counsels caution in applying innovation market analysis, and the inquiry may have to extend beyond current market participants.

40. Although there may be answers to particular questions raised by Rapp, Rapp is certainly correct in highlighting the lack of certainty in this area. This is not to say that we do not worry about R&D competition or competition to develop new products. It does suggest, however, that any merger-specific concerns we have should be narrowly focused on situations where there is enough development that we have some idea of what is likely to be produced from the R&D, who are likely to be the players competing

42. Consider as well other FTC pharmaceutical cases alleging an innovation market, including *Baxter Int'l, Inc.*, Dkt. C-3726, 123 F.T.C. 904 (1997) (consent order) (Baxter and Immuno were two of only a few companies seeking FDA approval for fibrin sealant, a product derived from blood plasma that controls bleeding in surgical procedures, in U.S. market with no current producers); *Upjohn Co.*, Dkt. C-3638, 121 F.T.C. 44 (Feb. 8, 1996) (consent order) (Upjohn and Pharmacia were two of only a few firms in advanced stages of developing topoisomerase I inhibitors, which are drugs used in conjunction with surgery to treat colorectal cancer); and *American Home Products*, 119 F.T.C 217 (Feb. 14, 1995) (consent order) (merger between two of three developers of rotavirus vaccines). Given the nature of the direct product market competition in these cases, they too likely could have proceeded without resort to innovation market terminology.

### ***Digital Equipment/Intel***

43. In the computer industry, an innovation market was one of three that was cited as raising concerns arising from a 1997 transaction between Digital Equipment Co. and Intel, involving Digital's Alpha microprocessor. The microprocessor market is another in which recent successful innovation had been limited to only a few firms, and Digital and Intel were aggressive rivals for next generation products. In addition, Digital's Alpha microprocessor was a significant competitor both to Intel's Pentium microprocessor and to Intel's next generation IA-64 microprocessor. In May of 1997, both firms sued each other for patent infringement by their respective products. In October of 1997, the companies settled the suits by agreeing to broad patent cross-licenses, the sale of Digital's microprocessor production facilities to Intel, and an agreement that Intel would produce Alpha microprocessors for Digital, which retained the intellectual property rights to Alpha.

44. The FTC was concerned that this agreement would have reduced competition in three separate markets: 1) the manufacture and sale of high-performance, general purpose microprocessors capable of running Windows NT in native mode; 2) the manufacture and sale of all general purpose microprocessors; and 3) the design and development of future generations of high-performance, general purpose microprocessors. In each of those markets, Digital's Alpha chips happened to be the highest performing and most technologically advanced threat facing Intel's own microprocessors. The Commission was concerned that Alpha would not remain competitively viable under the original terms of the agreement. Intel could have interfered with Digital's supply of Alpha chips and Digital might not have had the incentive to continue actively to develop and promote Alpha.

45. To resolve these concerns, the Commission entered into a consent order under which Digital would license the Alpha architecture to Samsung and AMD or other suitable partners so that they would be able to produce and develop Alpha chips.<sup>44</sup> Digital also agreed to begin the process of certifying IBM as a foundry for Alpha chips, thus establishing a manufacturing alternative to Intel. This relief preserved the Alpha chip as a viable product and a competitor to Intel's microprocessors.<sup>45</sup> Given the product specificity of the competitive concerns here, we believe, once again, that this case probably could have gone forward without resort to the innovation market concept.

### ***Halliburton/Dresser***

46. The DOJ's complaint challenging the Halliburton/Dresser merger alleged that the merger would result in increased prices and decreased quality for logging-while-drilling ("LWD") tools and services for oil and natural gas drilling projects, as well as in decreased competition in the development and improvement of LWD tools. LWD services provide information to oil and gas companies about the formations through which the companies are drilling, whether there is oil in the formations, and the ease

with which oil can be extracted. Total world-wide revenues for LWD services in 1997 exceeded \$500 million.

47. The LWD market was characterised by a few dominant companies, known as the Big Four (Schlumberger, Halliburton, Dresser, and Baker Hughes), and a number of smaller fringe players. Historically, the pattern of innovation had been that one of the Big Four (or its predecessor) developed a new LWD tool, improvements for that tool, and then an even more advanced model. After these innovations, the smaller companies would either buy an older generation of the tool from one of the Big Four, or they would spend several years attempting to create their own versions of the tool. By the time the smaller companies had created their own versions, the Big Four had created something new. In the history of the LWD market, no firm outside the Big Four had entered the LWD market with a major innovation. Under these facts, it was clear that the Big Four had specialised innovation assets that no other firm possessed, and the merger would have combined two of the only four major innovators.

48. Even though the firms promised to increase R&D spending if allowed to merge, the DOJ believed there was a significant anticompetitive problem for two main reasons. First, there was no single innovator among the Big Four. The breakthrough innovations were spread out among the group, so that all four of the companies had recent significant innovations. Second, and more importantly, Dresser and Halliburton had two very different innovation strategies. They approached R&D in significantly different ways. Dresser did little or no pure research (in the sense of expending funds purely to gain knowledge and not to develop a commercial product) and was less concerned about being the first to market with a new innovation. It preferred to learn from the mistakes of others. Halliburton, on the other hand, did more pure research and was more concerned about being the first one in the market. The merger threatened to eliminate one of these approaches, decreasing the chance of successful innovation. It also would have reduced the incentive for the merged firm to innovate and to improve similar, competing tools that the merged firm might deem redundant since it owned both.

49. The consent decree addressed innovation. It required Halliburton to sell its entire LWD business, including its manufacturing, R&D, sales and service capabilities. The divestiture focused on the specialised assets that were required for innovation. By creating a company with these specialised assets--a wide scope of tools with the capability to operate on a world-wide scale--the divestiture allowed another firm to enter the competition for innovation in this particular sector, ensuring competition in this high-tech industry. Once again, product-specific concerns lay at the heart of this transaction, even where loss of R&D competition was an area of concern; indeed, the DOJ's complaint made no reference to an "innovation" market.

#### ***Lockheed Martin/Northrop Grumman***

50. The DOJ's 1998 challenge to the \$11.6 billion proposed acquisition of Northrop Grumman by Lockheed Martin was at that time the largest merger ever challenged by the federal government, and was, to a large extent, an effort to preserve innovation competition. In the complain.4(ck)13.st m re 0 16 -2(qui)8( th)13.(to

the combination of Lockheed's airframe with Northrop's fire-control radar. While the complaint alleged significant price effects, the principal driver of the challenge was the merger's effect on innovation.

56. The Secretariat's Issues Paper further asks for examples of remedies that were customised to deal with mergers in innovation-intensive markets. As a general matter, the remedy in every case is tailored to the particular fact situation. That said divestiture as a remedy in innovation markets requires special care because the success of R&D efforts often depends on a complex array of expertise and sustained knowledge. It may be necessary to require on-going obligations beyond divestiture to assure that the purchaser has some probability of successful completion of the research effort. In *MCI/WorldCom*, discussed above, various conditions were imposed to ensure that the new competitor after the divestiture would have the ability effectively to compete. In *Glaxo*, the order imposed significant obligations on Glaxo to assist the acquirer in its efforts to continue the R&D effort successfully. Glaxo had to provide information, technical assistance, and advice to the acquirer about the R&D efforts, including consultation with and training by Glaxo employees knowledgeable about the project. The divestiture was a success in this case since both Glaxo and the acquirer of its intellectual property now have oral migraine drugs on the market. With the required assistance from Glaxo, the acquiring firm, Zeneca, received complete FDA approval in only 15 months.

57. In addition, merger efficiencies may affect the choice of remedy. For example, in *Ciba-Geigy*, a licensing remedy was preferred over divestiture because of the problems of separating ongoing R&D projects that involved a number of joint efforts with third parties.<sup>51</sup> Then-Commissioner Azcuenaga dissented as to the licensing aspect of this order, noting that divestiture would cure the anticompetitive problem in a "simple, complete, and easily reviewable" manner. The majority of the Commission determined that the gene therapy research efforts would be too difficult to disentangle from the merging firms, and divestiture would thus "not only ... hamper efficiency but also could be less effective in restoring competition if it led to co-ordinated interaction or left the divested business at the mercy of the merged firm."<sup>52</sup> Thus, while divestiture is certainly an easier remedy to impose and monitor, it may not always be the most effective way of restoring competition.

58. Finally, the dynamic nature of high-innovation markets and the possible short duration of market power may counsel a shorter duration for some remedial orders.<sup>53</sup> For example, in the *AOL-Time Warner* merger, the negotiated decree lasts for only five years, while the typical decree lasts for ten.<sup>54</sup>

**NOTES**

- <sup>1</sup>. Issues Paper at 3-4.
- <sup>2</sup>. *See, e.g.,*

are often aggressive in price and innovation, but competition is still important, if only because it is likely



<sup>14</sup>. *See, e.g.*, Richard T. Rapp,

<sup>21</sup>. *Ciba-Geigy Limited* (

render obsolete those skills that were used to develop the previous generation of technology"); Clayton M.

acquired firm, had been developing its SuperStrip technology for possible use as a disposable source label would be imbedded in goods or packaging at the manufacturing or distribution level, thereby obviating the need for retailers to install labels themselves. Sensormatic has been developing one of its proprietary technologies for potential use as a source label.

<sup>46</sup>. Office of the Under Secretary of Defense for Acquisition & Technology, U.S. Department of Defense, "Report of the Defense Science Board Task Force on Antitrust Aspects of the Defense Industry Consolidation," at 28 (Apr. 1994);

<sup>47</sup>. See Kovacic, *Competition Policy*, *supra* note 6, at 434-35 (describing benefits to defense purchasing agencies of maintaining rivalry between at least two suppliers in environment characterised by "often