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ABSTRACT

Title: Wintel Under the Antitrust Microscope: A Comparison of the European Intel Case with the U.S. Microsoft Cases

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The European Union has issued a statement of objections to Intel regarding the company's conduct aimed at suppressing competition from Intel's chief rival, AMD. Although the statement of objections remains confidential, the allegations in AMD's private litigation are public and provide a useful basis for analysis. Intel dominates the PC chip market almost to the same degree that Microsoft dominates the PC operating system market. As in the Microsoft case, Intel's aggressive marketing tactics prevented OEMs from offering rival products to consumers. And like Microsoft, Intel has engaged in this conduct to maintain its existing monopoly. These parallels between the Microsoft and Intel suggest that Intel's anticompetitive practices harm consumers, including American consumers, by denying them the access to innovative products at lower prices from rivals. The United States established that Microsoft repeatedly and willfully violated the antitrust laws, but failed to achieve an effective remedy. The EU, however, should have an easier time achieving an effective remedy. First, unlike the OS market, a viable competitor still exists in the chip market, i.e., AMD. Second, Intel has relied primarily on exclusionary rebates, not commingling of intellectual property, to maintain its monopoly. Consequently, the EU should be able to fashion a remedy that does not require Intel to redesign its product.

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Editor's Note: On October 29, 2007, the New York Times published an editorial titled "F.T.C. Goes AWOL," which is reproduced at the end of this Working Paper. It takes a line similar to that taken by the AAI in a letter to the F.T.C. on August 29, 2007, http://www.antitrustinstitute.org/Archives/intel8297.ashx, in which we urged the F.T.C. to investigate the allegations being made against Intel. This Working Paper provides background that may assist journalists and others who are interested in the issues raised by the AAI and the New York Times.

Keywords: antitrust, Advanced Micro Devices, competition, European Union, Intel Corporation, microprocessor chips, Microsoft Corporation, personal computer firms, operating systems, rebates, remedies

JEL Classifications

D4 – Market Structure and Pricing
K2 – Regulation and Business Law
L1 – Market Structure, Firm Strategy, and Market Performance
L2 – Firm Objectives, Organization, and Behavior
L4 – Antitrust Policy
L6 – Industry Studies: Manufacturing
M3 – Marketing and Advertising

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Wintel Under the Antitrust Microscope:
A Comparison of the European Intel Case with the U.S. Microsoft Cases

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Executive Summary

The European Union (EU) has issued a statement of objections to Intel Corporation ("Intel") regarding the company's conduct in the market for personal computer (PC) microprocessor chips aimed at suppressing competition from Intel's chief rival, Advanced Micro Devices (AMD). Although the statement of objections remains confidential for now, the EU has indicated that the objections concern three types of conduct by Intel: (1) rebates conditioned on the agreement PC original equipment manufacturers (OEMs) to purchase most, if not all, of their chips from Intel, (2) payments to OEMs to scuttle or delay the launch of products using AMD chips, (3) selling chips below cost to strategically important customers.

Despite the confidential status of the EU's statement of objections at this time, the objections ultimately resulted from concerns that AMD lodged with the EU. Therefore, one can use AMD's pleadings in its private antitrust lawsuit against Intel in the United States as a reasonable basis for providing the missing details. For purposes of this discussion, we will accept AMD's allegations as truthful, even though that is, of course, for courts to determine. The question is, if the facts are proven to be as alleged, what are the implications for competition policy?

Intel dominates the PC chip market almost to the same degree that Microsoft dominates the PC operating system (OS) market (many refer to the two companies collectively as "Wintel"). As in the Microsoft case, Intel's aggressive marketing tactics prevented OEMs from offering rival products to consumers. And like Microsoft, Intel has engaged in this conduct to maintain its existing monopoly. Microsoft's conduct served as the basis for two antitrust actions by the United States Department of Justice. (It should also be noted that the EU's Court of First Instance has upheld the European Commission's decision that Microsoft abused its dominant position by refusing to supply competitors with information needed for interoperability of their products and by tying the Windows Media Player to the Windows OS.)

These parallels between the Microsoft and Intel suggest that Intel's anticompetitive practices harm consumers, including American consumers, by denying them the access to innovative products at lower prices from rivals. Furthermore, just as intellectual property rights did not trump antitrust law concerns in the Microsoft case, so too intellectual property should not provide a license for Intel to engage in anticompetitive practices. Indeed, unlike Microsoft which engaged in predatory conduct in the browser market in order to maintain its monopoly in the OS market, the conduct at issue in Intel involves relatively mundane marketing, pricing and denial of access activities with rather clear cut exclusionary effects.

A successful outcome in the EU's case against Intel must include an appropriate remedy. The United States established that Microsoft repeatedly and willfully violated the antitrust laws, but failed to achieve an effective remedy. The EU, however, should have an easier time achieving an effective remedy. First, unlike the OS market, a viable competitor still exists in the chip market, *i.e.,* AMD. Second, Intel has relied primarily on exclusionary rebates, not commingling of intellectual property, to maintain its monopoly. Consequently, the EU should be able to fashion a remedy that does not require Intel to redesign its product.

Background: The Microsoft Cases

The United States Department of Justice brought two monopolization cases against Microsoft. The first case, settled by consent decree in 1995, focused on the tactics used by Microsoft to monopolize the OS market, and the second case, settled In 2001, focused on the tactics Microsoft used to maintain its OS monopoly. (Although the second Microsoft case focused on the "browser wars," the government established that Microsoft engaged in anticompetitive practices not to monopolize the browser market but to maintain its OS monopoly, *i.e.,* if Microsoft achieved a monopoly position in the browser market, then browsers would not eventually compete against Windows as an alternative platform for software development.) The Court of Appeals upheld the District Court's finding in the second case that Microsoft had illegally maintained its Windows monopoly.

Market Characteristics

PCs are commodities. With the exception of Apple, there really is no substantial differentiation among OEMs. For all practical purposes, Dell=HP=IBM. Regardless of the brand, all PCs run Microsoft's Windows OS and have a Central Processing Unit (CPU) microprocessor chip based on Intel's x86 instruction set. All of the software and hardware must work with the OS and the CPU. This has resulted in standardization of the basic components of the PC across OEMs. Consequently, OEMs, who have little choice but to compete aggressively on price, have razor thin profit margins, making them highly susceptible to price-related conditions imposed by either Microsoft or Intel.

Both the OS and the chip markets are characterized by network effects, *i.e.,* the more people who use a particular firm's product, the more attractive that product becomes. Although it is true that the manufacturing costs (both fixed and variable) of microprocessors are higher than those of software, both the OS and the chip markets have high fixed costs in the form of research and development.

Relevant Markets

The Microsoft and the Intel cases involve complementary relevant product markets. The relevant markets in the Microsoft cases consisted of web browsers and operating systems for PC's with CPU chips based on Intel's x86 instruction set. Intel competes in the market for the x86 instruction set CPU microprocessor chips. Geographically, both Microsoft and Intel compete in global markets.

Market Shares

With a market share in excess of 90%, Microsoft has no significant competitors in the PC OS market. (Apple's current line of computers can run Microsoft Windows, but PCs

manufactured by other OEMs cannot run Apple's OS.) Intel, however, faces one potentially significant competitor in the CPU chip market, AMD. Intel has a revenue market share in excess of 80%, while AMD, its closest rival, has a market share of about 15%.

Barriers to Entry

Microsoft enjoyed an extremely high applications barrier to entry in the PC OS market. To compete effectively, an alternative OS would have to either run existing Windows software or enter the market with a similar array of its own software. Since existing applications used Microsoft's proprietary Application Programming Interfaces (APIs), intellectual property law prevented the former means of entry, and the volume of applications needed for the latter form of entry rendered it infeasible.

Netscape, especially in conjunction with Java, offered a means of surmounting the applications barrier to entry by offering software developers a new set of APIs that would allow applications to run on any OS, including Windows. The U.S. case revolved around Microsoft's efforts to preserve the applications barrier to entry from the threat posed by Netscape.

Potential entrants into the chip market face a similar barrier to entry. Most importantly, new entrants would need to license the x86 instruction set from Intel. Otherwise, the new entrant's chips would not work with Windows or other existing PC software and hardware, and the new entrant would need the cooperation of much of the hardware and software industry, including Microsoft, to rewrite their applications to run on a different instruction set. These new applications would have to read and write files compatible with the applications on the installed base of Wintel PCs. When IBM designed its original PC in the early 1980s, IBM had sufficient power to require Intel to license the x86 instruction set to AMD, so that it would not be compelled to rely upon a monopoly supplier of a critical input. No OEM today has sufficient power today to require Intel to license the x86 instruction set to another chip manufacturer.

Microsoft and Intel Have Durable Monopolies

The Wintel duopoly defies the conventional wisdom that monopolies are temporary phenomena because high profits attract new entrants into a market. To break down the Wintel duopoly would require a paradigm shift in the information technology market.

Historically, the computer industry has in fact already gone through three paradigm shifts. The original "Mainframe" paradigm gave way in the 1980s as "Desktop" personal computers became increasingly powerful, inexpensive and ubiquitous. In the mid-1990s the "Desktop" paradigm gave way to the "Internet" paradigm as computers increasingly became a device for the receipt and distribution of information ranging from email to multimedia.

Although it did not threaten Intel, the paradigm shift from desktops to the Internet provided what may have been a unique opportunity for market forces to topple Microsoft's OS monopoly. Netscape browser emerged as the tool for using the Internet, and the browser was OS neutral. Java emerged as an OS neutral programming environment that worked with the browser. Yet Microsoft survived what could have been

the “Perfect Storm,” thanks in large part to its successful efforts at preventing the web browser from developing into a competing platform.

Like Microsoft, Intel achieved its monopoly with the paradigm shift from mainframes to desktops. In both instances, IBM chose their products for its PC and most of the rest of the industry soon followed.

Nothing better illustrates the durability of the Intel x86 monopoly than its own failed attempt to move OEMs to the Itanium microprocessor, a new Intel chip not based on the x86 instruction set. This would have resulted in a radical change in the PC hardware since the Itanium replaced x86’s 32-bit Complex Instruction Set Computing (CISC) architecture with a completely new 64-bit Explicitly Parallel Instruction Computing (EPIC) architecture developed jointly by H-P and Intel. The new architecture did not run existing applications. Even though Microsoft ported Windows to the new chip, it did not enjoy widespread adoption.

While Intel attempted to shift the PC industry away from its own x86 instruction set, AMD developed new 64-bit chips based on the x86 instruction set, the Opteron and the Athlon64. Unlike Intel’s Itanium chips, AMD’s chips ran *both* the installed base of 32-bit x86 applications and new applications that took advantage of the 64-bit architecture. Intel reacted to AMD’s innovation not only by belatedly developing its own 64-bit x86 chip, but also by engaging in anticompetitive tactics to prevent OEMs from migrating to AMD’s chips.

The efforts of each firm to generate competition in the other’s market also illustrates the durability of their monopolies. Microsoft has actively supported AMD’s chip innovations with AMD-customized Windows editions; Intel has actively sponsored and subsidized white-box OEMs employing Linux for the OS. Intel also actively supported JAVA, at least until Microsoft coerced an end to it.

Microsoft’s Anticompetitive Tactics

Most of the attention has focused on Microsoft’s bundling of the web browser into the OS, but the United States litigation against Microsoft also identified a variety of other tactics to prevent competing products from reaching consumers, including:

- “Per processor” licenses which required OEMs to pay Microsoft a royalty even if they substituted a competing OS on a PC;
- Large minimum commitments to install Microsoft products which could exceed the total number of PCs that an OEM expected to sell;
- Long term contracts with OEMs which effectively prevented them from switching OS suppliers for several years at a time;
- Distribution of a “polluted” form of the JAVA programing language without warnings that MS’s JAVA did not readily create applications that would run on competing platforms;
- Threatened retaliation against Apple;

- Denial of access to information necessary for OEMs and ISVs to develop compatible products on a timely basis if they dealt competing products; and
- Retaliation against OEMs who did not cooperate with Microsoft.

The anticompetitive effect of this conduct, especially with regard to Microsoft's web browser, was somewhat complex. The 1995 consent decree prohibited Microsoft from continuing to use the first three types of conduct, all of which directly excluded competition from the OS market. The second lawsuit dealing with the browser, however, focused not on the browser market, but rather the anticompetitive effect in the OS market caused by Microsoft's tactics in the browser market.

Intel's Alleged Anticompetitive Tactics

On July 27, 2007, the EU confirmed that it had sent a Statement of Objections to Intel. According to the EU's press release, the objections to Intel's abuse of its dominant position concern "three types of conduct aimed at excluding AMD, Intel's main rival, from the market." The conduct consists of:

- Rebates to OEMs conditional upon their purchase of all or nearly all of their CPU chips from Intel;
- Payments to at least one OEM to delay or cancel a product line using AMD chips; and
- Below cost sales to strategic customers.

Compared to Microsoft, the conduct at issue is relatively straightforward. Given the razor thin profit margins of OEMs, they can hardly refuse to take advantage of the inducements offered by Intel. Payment not to use AMD chips directly excludes AMD from competing in the marketplace. While below cost pricing is controversial in American antitrust law, the controversy primarily concerns whether such pricing occurs in a particular instance, not its anticompetitive effect.

The first type of conduct is particularly insidious in its effect on competition. While the EU has not disclosed the specific types of rebates to which it has objected, presumably the EU objects to the same "first dollar discount" rebates that are the subject of AMD's U.S. lawsuit against Intel. These types of rebates/discounts have been severely criticized. As alleged by AMD, the OEMs do not receive a quantity discount in steps. Instead, OEMs receive a rebate on the last chip purchased. So if Intel sets a quota of 100 chips for an OEM and the OEM uses only 99, then that OEM receives no discount. Without the Intel rebate, the OEM may not make a profit on any of its sales. Intel sets the quota based on the particular OEM's capacity and/or projected sales. Consequently, an OEM will consider purchasing AMD chips only to the extent that its anticipated sales and manufacturing capacity exceed Intel's quota.

For example, assume that an OEM has a manufacturing capacity of 101 PCs and receives a $100 rebate from Intel if and only if the OEM installs Intel chips on at least 100 PCs. The OEM will purchase no more than one AMD chip. If AMD wants to sell the OEM two chips, then AMD must give the OEM a $100 rebate to the OEM. Intel can spread the cost of the rebate over 100 chips, *i.e.,* the rebate costs Intel $1 per chip, but AMD can only spread the cost of the rebate over two chips, *i.e.,* the rebate costs AMD $50 per chip.

By confining AMD to a small market share, the rebates also have a detrimental effect on innovation since AMD must spread its fixed costs of research and development over much smaller unit and dollar sales. In this respect, it is important to remember that it is only because of AMD's innovation that consumers could take advantage of new 64-bit applications without having to give up their existing 32-bit applications. Intel now makes a 64-bit x86 chip, but it does so only as a result of competition from AMD. It would appear that if Intel is permitted to counter innovation by a competitor through first-dollar discounting, there is little likelihood that the competitor will be able to continue to invest in innovative products, because there will be no payoff for successful innovation.

Intellectual Property Concerns

The products at issue in both the Microsoft and Intel cases enjoy protection under intellectual property law. To date, however, neither the courts in the United States nor the EU have accepted the argument that intellectual property concerns exempt Microsoft from liability for its anticompetitive conduct. Intellectual property concerns should play even less of a role in the Intel case since AMD has a license to the x86 instruction set, and unlike the Microsoft case, the Intel case is not about denial of access to intellectual property. However, the fact that no new entrant is likely to receive a similar license means that the microchip market is likely to remain on a world stage as either a duopoly or a monopoly.

Remedies

An effective remedy will be critical to the success of the EU's case against Intel. Notwithstanding the fact that the United States proved that Microsoft violated Section 2 of the Sherman Act and that the United States Court of Appeal for the District of Columbia unanimously upheld this judgment on appeal, the conventional wisdom suggests that the U.S. lost the Microsoft case because the complex conduct remedy has proven ineffective. After all, Microsoft's illegally maintained OS monopoly remains as firmly entrenched as ever.

Fashioning an effective remedy in the Intel case should not prove nearly as difficult. The conduct at issue is much simpler. An order from the EU directing Intel to cease the specific rebate and pricing activities as well as prohibiting Intel from paying OEMs to delay or not to use competitors' products should prove effective and relatively easy to enforce. In its announcement confirming that a Statement of Objections had been sent to Intel, the EU indicated that it would seek such a remedy. Similar prohibitions against Microsoft in the 1995 consent decree were insufficient not because Microsoft failed to obey them, but because Microsoft had the ability to switch to other tactics, *i.e.*, bundling products and denying competitors in other markets access to critical information about the OS. It bears noting that although there are significant differences between the U.S. and the EU cases against Microsoft, the EU's push for unbundling and stringent conduct remedies was upheld by its Court of First Instance, and Microsoft has decided to comply with the remedies rather than appeal the Court's decision.

Conclusion

The allegations against Intel do not involve an unusual legal or economic theory. Rather, U.S. law has consistently condemned this type of exclusionary conduct as anticompetitive, including similar conduct in the Microsoft cases. More specifically, a growing body of cases and academic literature has denounced first dollar discounts.

Most importantly for the world's consumers, the anticompetitive effects of Intel's misconduct have been felt on a global basis. Japan, Korea and now the EU have take action to stop Intel's anticompetitive conduct in their jurisdictions.

Americans, no less than the Japanese, Koreans and Europeans, have a stake in protecting competition in the PC microprocessor chips. The benefits to consumers everywhere include not only lower prices but also more innovations. Indeed, history has shown that technological rivalry in this market provides direct benefits to consumers in the form of products that would not have existed otherwise.

The dominance of the Wintel duopoly may continue, but that is no reason not to protect and promote competition where possible. To date, the EU has pursued the most successful public actions against the anticompetitive practices of Microsoft and Intel. Indeed, the U.S. has not taken any public enforcement action against Intel, although AMD has filed a private lawsuit in U.S. District Court. That the Federal Trade Commission has yet to confront Intel serves a reminder of the critical and increasing importance of private actions under U.S. antitrust law. So there is a "happy" balance of sorts: the EU is outperforming the U.S. on public enforcement while the U.S. outperforms the EU on private enforcement. Consumers on both continents benefit from these complementary strengths of these different antitrust regimes.

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Appendix

New York Times Editorial, October 29, 2007

Suppose your local supermarket had a loyalty card that gave you great discounts, but only if you promised not to shop anywhere else. According to regulators from the European Union, Japan and South Korea, that looks just like what Intel is doing.

They say Intel is improperly protecting its stranglehold of the microprocessor market by offering big discounts and rebates to computer makers who minimize the use of processors made by rival Advanced Micro Devices, and punishing those who stray with higher prices.

Yet despite these warnings, there is one regulator that seems largely unconcerned. The United States Federal Trade Commission is still holding back from opening a formal inquiry into the company's practices.

The abuse of market power to protect a monopoly hurts consumers and hinders innovation — locking out smaller rivals that may have better products with new features or lower prices. With an 80 percent to 90 percent share of the microprocessor market, Intel wields much more power than your local supermarket. Its threat to raise prices the moment a customer tries to buy from rival A.M.D. can lock in even the largest computer makers — which depend on Intel for most of their products and can't simply swap all their processors overnight. And with such a level of control, Intel doesn't have to exert itself to come up with new and better products.

Two years ago, Japanese regulators said Intel was violating antitrust laws and ordered the company to drop these schemes. The European Commission has accused the company of illegally trying to drive A.M.D. out of the market. South Korean regulators have now objected to Intel's efforts to maintain market dominance.

Members of the F.T.C. argue that the agency can do better with an informal, cooperative review of the charges against Intel. A formal investigation gives the commission power to issue subpoenas and compel testimony from executives. Right now, Intel only has to hand over the information it wants to. The F.T.C.'s Republican majority clearly shares the "starve the regulators and coddle industry" philosophy that has driven the Bush administration for seven years. It is bad for America's consumers and it is bad for American business.