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¹ Senior economist in the Bureau of Economics at the Federal Trade Commission. This paper extends an existing analysis completed in 2004 to address the current interest in vertical analysis. It is not an FTC work and thus the standard disclaimer suggesting the opinions expressed in this paper are those of the author and do not represent those of the Federal Trade Commission, a Commissioner or a Bureau is not technically necessary, but is applicable to avoid confusion. I would like to thank Jeffrey Fischer for helpful comments on this note.

I. INTRODUCTION

Given the current interest in vertical mergers, it is important to understand that the anticompetitive effects are horizontal in nature, with the vertical conduct merely enabling the horizontal injury.² In complex cases, it will be necessary to balance efficiency effects in the vertically related market with the net adverse effects in the horizontal market under review. Thus, for vertical analysis, it seems useful to develop evidence on the adverse horizontal effects, before investing resources to fully investigate the more complex upstream vertical relationships and the even more complex balancing review.

This multi-stage analysis can be illustrated by reviewing the *Microsoft* case of the 1990's.³ Although not a merger, the alleged vertical conduct plays the role of a merger, and thus seems easily generalizable. It is generally known that the U.S. Department of Justice's *Microsoft* litigation involved collection of exclusionary conduct that could allow Microsoft to maintain their monopoly in Windows-based operating systems for IBM-compatible personal computers ("PCs"). Vertical concerns can be categorized as either contractual or *de facto* exclusion.⁴ Contractual exclusion tends to be relatively easy to explore (the contracts exclude or they do not); while *de facto* exclusion requires extensive analysis, as exclusion is often difficult to distinguish from competition. Both theories appeared relevant to some *Microsoft*-related issues and may be applicable to current antitrust issues in platform competition on the Internet, suggesting insights based on the *Microsoft* matter may aid current analysis of various forms of vertical behavior, including vertical mergers.

One key point that will become obvious is the outcome of the review process may depend on the magnitude of the competitive effect identified in the review. If the market effect is very large, it may make sense to find a concern for quite moderate probabilities associated with the exclusionary concern. On the other hand, if the market effect is moderate or small, larger probabilities would be required to generate a comparable effect.

For both contractual and *de facto* exclusion, the vertical activity in the related market is alleged to protect market power in the core market (hence the name, "monopoly maintenance"). For the more complex *de facto* exclusion cases, which require extensive investigation, serious attention should be given to the credibility of this competitive concern before undertaking a full investigation.

This paper provides an algorithm to structure vertical competitive analysis, relevant to both merger and non-merger activity. Once defined by a review of the *Microsoft* case, the algorithm is applied to an overview of the potential effects of the *Facebook/Instagram* merger. The reader is cautioned that this application is for illustrative purposes only and any real antitrust case would need to be based on a deep dive into the relevant facts.

2 Economists have known since the early 90's that possibility theories can show vertical mergers have anticompetitive effects in one of the two related horizontal markets. See, Rasmusen Eric B., Ramseyer, J. Mark, and Wiley, John S., *Naked Exclusion* 81 AM. ECON. REV. 1137 (1991). As economists work hard to win tenure, numerous other theoretical models exist, suggesting other possible ways for a vertical merger to increase price. Not surprisingly, some analyses are better than others.

3 For a detailed overview of the *Microsoft* matter, see Coate, Malcolm B. and Jeffrey H. Fischer "The Truth is Out There: The Microsoft Case Meets Market Realities," 2004, available at SSRN http://papers.ssrn.com/sol3/papers.cfm?Abstract_id=638243. Page 48 presents a quick overview of the court decision while the monopoly maintenance concern is discussed on pages 49-61 for Java investigation and pages 64-71 for the browser investigation.

4 *Id.* at section IV (pages 79-83). Some evidence exists to suggest that Microsoft engaged in contractual exclusion to prevent the installation of a dual Windows-Linux operating system. This tactic could have precluded the development of a collection of Linux based applications sufficient to enable a Linux based PC to have broad commercial use on the consumer market.

II. AN ALGORITHM FOR VERTICAL ANALYSIS

The basic structure of the algorithm is simple, first evaluate the potential for an anticompetitive effect; if the horizontal concern is credible, invest the resources to fully explore the potential for sufficient exclusion in the relevant vertically-related market to trigger the concern. If the vertical exclusionary tactics also offer competitive benefits, the final analysis determines if the relevant efficiencies outweigh the net potential anticompetitive effect triggered by the vertical exclusion.⁵ As facts are unlikely to be known with certainty, the competitive analysis can only offer an estimate of the expected value in which the potential adverse effects are weighted by the estimated probability of its likelihood of occurrence.⁶ In effect, this approach could create an opportunity to generalize the concept of “likely to substantially lessen competition.”⁷

Four questions are relevant in determining the potential for an anticompetitive effect in the horizontal market of concern. First, is the future of competition in a market likely to be affected by a specific change in the environment? In *Microsoft*, the concern involved the development of a middleware platform (enabled by the growth of the Internet) that would sit on top of Windows and run a broad collection of generic applications written for various computing devices. In theory, this turn of events could undermine Microsoft’s pre-existing market power. Second, is the exclusionary conduct related to an anticompetitive effect on that market? For *Microsoft*, the alleged exclusion focused on the elimination of market leaders in the vertically-related Java-technology and/or browser markets to prevent these firms from developing extensions that would serve as the procompetitive middleware platform. Third, do any alternatives exist to negate the potential impact of the exclusionary concern? Again, in *Microsoft*, Java and browser products seemed to offer the best approaches to aid the development of middleware and no other technologies offered similar promise. Finally, the evidence would need to show that the anticompetitive effect of concern was material, suggesting its occurrence would be likely to substantially lessen competition. Thus, the *Microsoft* litigation would be expected to show that loss of middleware would serve to protect the Windows-based market power.

An evaluation of the evidence associated with the competitive concern did not offer a clearly dispositive conclusion. However, some insights were available. The Internet was seen as changing the world, although analysts were optimistic in envisioning the rapid development of what we now know as “cloud computing” to create a need for multi-platform middleware. Moreover, Java and browsers were two clear vectors for the development of middleware, with the evidence clearly stronger for the Java threat. No obvious alternative existed. Of course, insights on the implications of the development of middleware software remained predictive, as the development of middleware was a prediction. Overall, it does not seem possible to reach a dispositive conclusion on the merits. Thus, although the case was not clearly proven by traditional antitrust standards, it is impossible to conclude that no material exclusionary effect was possible. Here, it seems necessary to consider exactly what “likely to substantially lessen competition” means in an inherently unknown world?

Given the importance of the operating system to the PC, and more relevant for today, the importance of social media and search, should anticompetitive effects be taken seriously when they are possible, but not clearly likely by traditional rules? In effect, should an expected value standard be applied that would find a violation when a low probability is combined with a very large potential anticompetitive effect? When reconsidering the *Microsoft* court decision, maybe an expected value finding for the competitive injury was implicitly made. Thus, for extremely significant markets, should an expected value analysis be used, such that large losses of competition can be addressed even when the evidence confirming the effects’ probability is limited? As competition in the high tech sector is so difficult to predict, should antitrust be fenced in by a definition of “likely” that evolved in the smoke-stack era of antitrust?

Another four considerations are needed to address the potential for exclusion in a vertically related market. First, does the firm under review hold sufficient market power in the related market to exclude a vertically related rival? For *Microsoft*, the answer was obvious, as the Windows operating system dominated the relevant PC business. Second, does the exclusion actually occur in the related market? The Java evidence

5 This structure borrows liberally from Coate and Fischer, Section IV (*supra*, note 3), although the organization of the presentation is tweaked, with the discussion focusing first on four of the five conditions associated with the monopoly maintenance effect, then picking up the four conditions associated with the exclusion in a vertically related market, before concluding with the efficiency condition. Coate and Fischer’s approach provides a useful post-mortem of the *Microsoft* case, while the generalization in this paper offers a method that may be more useful in vertical analysis.

6 Although economists can offer mathematical models and present simulation results, these analyses are also dependent on the accuracy of their assumptions and thus face similar problems. If their assumptions are wrong, the model presents only an illusion of quantification. For an example *see*, S. Moresi and S. Salop, *vGUPPI: Scoring Unilateral Pricing Incentives in Vertical Mergers*, 79 ANTITRUST L. J. 185 (2013).

7 As this note avoids any real discussion of the law, the term “likely to substantially lessen competition” should be interpreted to reflect on the relevant legal standard for the case involved in the analysis.

is clearly weaker, as Microsoft implemented a collection of exclusive contracts related to its own brand of Java, but Sun's Java product remained relevant in the competitive process. In contrast, the browser wars showed Microsoft exploiting numerous opportunities to leverage its Internet Explorer browser into the market.⁸ Third, was the exclusionary behavior successful at marginalizing its target? Here, the evidence is also much better for Netscape than Sun's Java, as Netscape's product was marginalized, Sun's suffered to a much smaller extent. Note the question of Microsoft competing with an efficient browser is delayed until the final analysis. Fourth, did any counterstrategies exist to negate the exclusion? Sun obviously worked hard to compete and maintain the viability of its product, while Netscape faced limited options, eventually merging with America Online ("AOL").

Although the evidence on the exclusion strategy is not dispositive, a few points can be made. The exclusion clearly worked better at marginalizing Netscape than Java, as Java remained a viable consumer choice. Moreover, Netscape's counter-strategy of merging with AOL was doomed once it became obvious that the AOL "parallel universe" was doomed by the growth of the open Internet. Basically, the exclusion analysis provides reasonable evidence for browsers, but weak evidence for Java. In effect, the analysis also must focus on expected values.

A final review would need to compare the efficiencies associated with the Microsoft browser (and Java) with the potential loss of competition due to the marginalization of middleware. Such a comparison must address the question of whether Microsoft's product ended up as more efficient only because the exclusionary tactics managed to "cut off their [Netscape's] air supply [money]." Moreover, slower innovation in browsers might have simply led to faster innovation in plug-ins to provide the missing functionality. It would appear hard to argue that one firm (Microsoft) could have materially slowed the Internet. As these facts are not well developed in the record, it is difficult to do more than raise a few questions.

This staged approach to monopoly maintenance is readily generalized to other concerns by replacing the initial focus on undermining the incumbent's market power with an alternative analysis addressing some increase in market power associated with the alleged exclusion.⁹ Likewise, the entire exclusion analysis is simplified in a merger case (or any other example of contractual exclusion). An example of a merger scenario is presented in the next section.

III. AN EXAMPLE OF A HYPOTHETICAL MERGER CASE

To illustrate the application of the methodology to a merger, consider a hypothetical antitrust analysis of the consummated *Facebook/Instagram* merger. Although the merger closed in 2012, the antitrust laws do not include a statute of limitations, allowing past mergers to be challenged once a transaction appears to generate substantial competitive concerns. When consummated, Instagram offered a simple social media application, one that focused on photo sharing. The product was experiencing explosive growth, having quickly acquired 27 million uses and expected to roll out on the Android operating system to increase that number to 50 million.¹⁰ Although the product had no revenue stream, it had the potential to use innovative cell phone technology to become a leading social media product, in effect undermining the Facebook monopoly.

An *ex-post* vertical analysis would evaluate whether Instagram should be considered a competitive threat to the Facebook monopoly by observing how the competitive process played out by reflecting on the four questions addressed above. The first question would explore the potential (actual) impact of the development of cell phone technology on Facebook's social media monopoly. Here, casual observation suggests that a cell phone platform facilitates different types of social media communications, creating the potential for a new platform screen.¹¹ Second, did the Instagram products offer the alternative platform. Again, the answer seems clearly yes, as Instagram is designed for cell phones and their

⁸ No discussion of exclusion is complete without noting the technical impossibility of absolute success, because the consumer can always download and install software. Thus, any discussion of this exclusion is likely to require an extensive factual discussion.

⁹ In *ATT/Time Warner*, the key concern focused on the ability of AT&T to marginalize horizontal distributions by raising their costs of Time Warner content via the threat of exclusion (blackout) in the negotiation process. No commentary is offered on that case, because the litigation is not complete.

¹⁰ See, "Facebook buys Instagram for 1 Billion," available at <https://techcrunch.com/2012/04/09/facebook-to-acquire-instagram-for-1-billion/>.

¹¹ *Id.* As noted in the article, some analysts thought the Instagram cell phone screen was superior to the more cluttered look of the Facebook interface.

ability to take photographs. It appears that the Instagram platform is popular with younger people whose lives revolve around their phones.¹² Third, do any other disruptive products exist? Here, Snapchat is mentioned as a choice, but a quick review of that product suggests it is more of a communication tool, than a social media application. Moreover, if the current stock valuation is a guide (slow decline), Snapchat may be sliding towards fringe firm status. Finally, does the merger of Facebook and Instagram appear anticompetitive? It certainly looks like the merger combined two firms that are now closest competitors. And for lack of competition, is it really necessary to go any further than the sorry performance of Facebook with respect to consumer privacy?¹³ This observation avoids the need to focus on price, because, for dominant services such as Facebook and Google, the loss of privacy seems to be the price.¹⁴ More competition implies better protection of user privacy and an obvious gain in consumer welfare. *Ex-post*, the market would seem more competitive if Facebook and Instagram had their relationship status changed to single.¹⁵

Exclusion concerns can be quickly addressed, because mergers exclude rivals by acquisition and mergers that later lead to competitive concerns matter. This leaves only the first factor, the establishment of market power, and that answer is obvious, given Facebook's dominance both in 2012 and today. Possibly, one could consider counter-strategies to a merger, if large sophisticated end use customers existed, but social media serves individuals and thus the concern is moot.

For consummated mergers, a reasonable case can be made that balancing analyses are always required, because the efficiency of the original merger should be credited against anticompetitive effects, as should the quicker development of the products of the merged firm. For the Instagram acquisition, the initial efficiencies would seem to be *de minimis* as the firm was only a start-up. This leaves the claim that Facebook has created substantial consumer welfare due to its six years of investing in the Instagram brand. Consumers obtained goods that they would have otherwise had months or years later. Of course, these benefits would need to be measured net of the privacy sacrificed to Instagram and its Facebook parent. Moreover, if efficiency benefits count, then it also seems reasonable to count anticompetitive effects due to the loss of an independent Instagram over the last few years. Such a balancing could go either way, and thus hardly offsets the loss of privacy from the current Facebook market power. Moreover, Facebook might want to claim the joint ownership offers the firm substantial efficiencies. Here, it is not even clear what the claim of efficiencies would be, other than economies of scope and scale that might further entrench a monopoly.¹⁶

Finally, it useful to at least look at chilling effects associated with a policy that tells dominant firms that the government will dissolve your mergers if you are too successful competing with your core business. One response would be to note such an aggressive policy is a feature of antitrust enforcement in a platform world. Incumbent monopolists should defend their platform via internal growth, not by merging with potential threats. Second, a divestiture order merely requires a spin-off. Facebook stockholders would own two firms instead of one. Additional thought could uncover other issues that should be considered in this analysis.

12 One estimate suggests 71 percent of 18-24 year olds use Instagram, suggesting greater use than Facebook. "Social Media Use in 2018," available at <http://www.pewinternet.org/2018/03/01/social-media-use-in-2018/>. Note, this study takes a very broad definition of social media, including Pinterest, a product that seems to have generalized the idea of YouTube from videos to any content, LinkedIn, a professional site, Twitter, a commentary site best known for its 2 AM use by the President of the United States, and WhatsApp, a messaging site also owned by Facebook (suggesting the potential for additional work to explore if ownership of this product enhances Facebook's market power).

13 Citation to the numerous Facebook privacy protection failures does not seem necessary, as they qualify as public knowledge.

14 I am reluctant to cite the idea of "privacy as the price paid for the use of an Internet platform" to a particular author due to the risk of being wrong.

15 In effect, these regime shift questions address the same considerations studied in a merger, if one firm owned both products, could it impose an adverse unilateral effect on the market? Do any other firms have the potential to reposition and compete? Could entrants defeat the adverse effect?

16 In contrast, no one who experienced the "Blue Screen of Death" from an application choking the operating system was thrilled with the idea of one "baby-Bill" selling Office and another "baby-Bill" selling the Windows operating system. But here, the efficiencies are clearly vertical, with Microsoft ensuring this paper does not disappear in a crash before I save it. Possibly, Facebook could also note some vertical efficiencies lost by creating "baby-Zucks" in a divestiture.

IV. CONCLUSION

The *Microsoft* example certainly shows that vertical investigations are likely to be extremely complicated and require a deep understanding of the relevant facts. By addressing the horizontal concern first, vertical analysis avoids reviewing the exclusion evidence when an anticompetitive effect is not credible. Moreover, even with a detailed analysis of the facts, vertical cases are likely to be very complicated to prove. This leads to the second consideration, should the standard of proof be linked to the expected value of an anticompetitive effect when the potential adverse effect is extremely large? What standard should be used (was used implicitly in *Microsoft*) to set the concept of “likelihood” of an anticompetitive effect in vertical investigations of monopolists in some of the largest and most important markets in the economy?

The same Microsoft-inspired algorithm performed relatively well in evaluating a hypothetical merger case focused on the consummated *Facebook/Instagram* merger. Here, the core analysis studied the monopoly related effect triggered by the merger. Although this review suggested that attention should be paid to efficiencies and the potential for chilling effects, the discussion noted efficiencies may not negate large monopoly effects and policy may benefit from an active enforcement program.

Analyses of vertical exclusion and mergers are likely to remain fact-specific, with theory generalized to address particular fact situations. However, the two examples in the paper do suggest a role of vertical analysis in innovative investigations of internet-based platform markets. As these monopolies are threatened by regime shifts that sweep away their power, careful vertical analysis may be necessary to ensure that regime-shifts remain viable and *ex-post* enforcement may be necessary to restore competition, when competitive benefits are lost to what, when consummated, was thought of as vertical merger. Traditional antitrust tools would seem effective in addressing these concerns, although broad interpretations of the basic concepts may be appropriate in special case situations.

