Rivals' Exit and Vertical Merger Evaluation

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Abstract

We discuss a subset of vertical mergers, where the exercise of market power and the efficiencies enabled by a vertical merger reduce rivals' profits, making rivals' exit a potentially serious concern. Rivals' exit can fundamentally alter the welfare analysis of vertical mergers due to the reduction in product variety to consumers and the reduction in the number of competitors that would otherwise exert downward pricing pressure. An exit-inducing vertical merger might reduce welfare even if it is a welfare-enhancing merger absent exit. We present a theoretical framework to analyze vertical mergers that focuses on the possibility and consequences of exit, discuss the antitrust implications for merger evaluation, and provide examples. We argue that the possibility of rivals' exit should be an integral part of the analysis of vertical mergers.

Keywords: Antitrust, Vertical Mergers, Rivals' Exit, Double Marginalization, Merger Evaluation, Competition Policy.

JEL Codes: K21, K41, L42, L44, L52.

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I. Introduction

On June 30, 2020, the Federal Trade Commission (FTC) and the Department of Justice (DOJ) issued the Vertical Merger Guidelines (VMGs).[1] The VMGs outlined how the Agencies[2] ought to evaluate whether vertical mergers comply with the statutory provisions of United States antitrust law.[3] They replaced the extant and obsolete portions of the 1984 (Non-Horizontal) Merger Guidelines.[4]

A significant innovation in the VMGs was the inclusion of a theory of anticompetitive harm,[5] whereby a vertical merger might harm competition due to firm conduct, such as exit, foreclosure and raising rivals' costs.[6] Notably, this theory of harm was absent in the 1984 Guidelines.[7]

On September 15, 2021, the FTC rescinded the VMGs and associated commentary.[8] While the DOJ did not, both agencies joined efforts to reconstruct the VMGs on January 18, 2022, when they jointly launched a public inquiry asking for "public input on ways to modernize federal merger guidelines to better detect and prevent illegal, anticompetitive deals in today's modern markets."[9]

In this Article, we respond to the public inquiry. We provide a framework to analyze vertical mergers that focuses on the possibility and consequences of rivals' exit. We show that rivals' exit might be a natural consequence of a vertical merger, although perhaps unintended. While the idea that vertical mergers might induce rivals' exit is not new, as discussed below, our model provides

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[1] United States Department of Justice and The Federal Trade Commission (2020), "Vertical Merger Guidelines." Available at (accessed on February 8, 2022): https://www.ftc.gov/system/files/documents/reports/us-department-justice-federal-trade-commission-vertical-merger-guidelines/vertical_merger_guidelines_6-30-20.pdf [hereinafter VMGs].

[2] In this Article, we use the term *Agencies* to refer collectively to all government agencies and regulators that might review a merger.

[3] Section 7 of the Clayton Act, 15 U.S.C. § 18; Sections 1 and 2 of the Sherman Act, 15 U.S.C. §§ 1–2; and Section 5 of the Federal Trade Commission Act, 15 U.S.C. § 45.

[4] United States Department of Justice and The Federal Trade Commission (1984), "1984 Merger Guidelines." Available at (accessed on February 8, 2022): https://www.justice.gov/archives/atr/1984-merger-guidelines. Footnote 1 in the VMGs states: "*These Guidelines supersede the extant portions of the Department of Justice's 1984 Merger Guidelines, which are now withdrawn and superseded in their entirety.* They reflect the ongoing accumulation of experience at the Agencies. These Guidelines may be revised from time to time as necessary to reflect significant changes in enforcement policy, to clarify existing policy, or to reflect new learning." (Emphasis added.) VMGs, *supra* note 1, § 1. See also the previous the "1968 Merger Guidelines," § II. Available at (accessed on February 8, 2022): https://www.justice.gov/sites/default/files/atr/legacy/2007/07/11/11247.pdf

[5] VMGs, *supra* note 1, § 4a. See also the European Commission Guidelines, "Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings," § IV. Available at (accessed on February 8, 2022): https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2008:265:0006:0025:en:PDF

[6] See Section III for the terminology and definitions.

[7] *Supra* note 4.

[8] Federal Trade Commission, Press Release (2021), "Federal Trade Commission Withdraws Vertical Merger Guidelines and Commentary," September 15, 2021. Available at (accessed on February 8, 2022): https://www.ftc.gov/news-events/press-releases/2021/09/federal-trade-commission-withdraws-vertical-merger-guidelines

[9] Federal Trade Commission, Press Release (2022), "Federal Trade Commission and Justice Department Seek to Strengthen Enforcement Against Illegal Mergers," January 18, 2022. Available at (accessed on February 8, 2022): https://www.ftc.gov/news-events/press-releases/2022/01/ftc-and-justice-department-seek-to-strengthen-enforcement-against-illegal-mergers

a simple unified approach for the evaluation of vertical mergers using horizontal-merger criteria, as sought by Robert H. Bork.[10]

In a horizontal merger, the increase in the merged firms' prices causes a diversion of sales *between* the *substitute* products owned by the merged firm. An increase in the price of one of those products diverts sales to the other product, thereby raising the merged firm profit. Rivals benefit from this exercise of market power, as the underlying diversion of sales spills over *to* their products. Thus, in a horizontal merger, the diversion of sales shifts business *to* the rivals of the merged firm, which increases their profits.

In a vertical merger, the increase in the merged firm's prices upstream (downstream) causes a diversion of sales *from* the rivals' products *to* the merged firm's products downstream (upstream). A vertical merger may increase market power—upstream and downstream—by allowing the internalization of the diversion of sales between firms that produce *complementary* products. Thus, in a vertical merger, the diversion of sales shifts business *from* the rivals of the merged firm, thereby decreasing their profits. It might cause some rivals to exit, further harming social welfare. The efficiencies enabled by vertical mergers discussed below also divert sales from rivals, further increasing their exit probability.[11]

We show that vertical mergers that induce exit *might* be particularly harmful for consumer welfare. This feature is present even in the *best-case* scenarios whereby, absent exit, a vertical merger is welfare-enhancing for consumers. Exit is of particular concern in assessing vertical mergers because natural forces arise in vertical mergers (but not in horizontal mergers) that are welfare-enhancing if and only if an exit is not induced. Therefore, we argue that the possibility of rivals' exit should be an integral part of the analysis of vertical mergers and their theory of harm. *Ex ante* identification of vertical mergers that are potentially harmful can, thus, provide antitrust Agencies scope for high priority enforcement.

To be sure, we do not argue that vertical mergers are intrinsically anticompetitive. Nor do we argue that all vertical mergers induce rivals' exit. Yet a vertical merger that induces rivals' exit might be very harmful. Thus, we argue that the evaluation of rivals' exit should be an essential element when analyzing vertical mergers. The examples discussed, *infra*, show that the possibility that rivals' exit might substantially lessen competition is a central feature that has been considered by the Agencies and the Courts reviewing past vertical mergers. However, this important consideration is not reflected in the latest draft of the VMGs, aside from the usual exclusionary harm theories.[12]

Vertical mergers are notoriously complex. In contrast to horizontal mergers, vertical mergers feature an intrinsic efficiency: the elimination of double marginalization (EDM).[13] The EDM has a procompetitive effect.

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[10] "Whether or not one believes in the law's foreclosure theory, therefore, *all so-called vertical merger cases should be handled through the application of horizontal merger standards*." Bork adds in the footnote: "If there is any realism in the theoretical case of predation […], that may be handled by a rule making vertical mergers unlawful under Section 2 of the Sherman Act when acquiring a company has at least a market share of, say, 80 percent **and** specific intent to monopolize can be proved." (Emphasis and bold in original.) Robert H. Bork (2021) [1978], "The Antitrust Paradox: A Policy at War with Itself," Bork Publishing, ISBN 978-1736089705, at 244-245.

[11] See Section II, *infra*, for examples.

[12] *Supra* note 5; *infra* note 20.

[13] See Section III, *infra*, for the definition of elimination of double marginalization.

However, vertical mergers also have anticompetitive effects. The vertically integrated firms might increase the price or lower the quality of the inputs supplied to their rivals, raising rivals' costs (RRC). The vertically integrated firms might also refuse to supply the inputs to rivals altogether (foreclosure). While some vertical mergers may enhance overall welfare, others may stifle competition and harm consumers and social welfare. It is complicated to distinguish *ex ante* which vertical mergers are welfare enhancing.

In our theory, harm to social welfare occurs if the vertical merger enables the exercise of market power. It might substantially lessen competition, as required by the statutory provisions.[14] A necessary condition is that the merged firm transacts with downstream (upstream) rivals and so has the potential to exercise market power upstream (downstream).[15] To prove harm, it is also necessary to establish that the magnitude of any anticompetitive effect is likely to be substantial. Proving the latter involves considering specific industry features, such as the relative size of the firms and the diversion ratios. Both the exercise of market power and the efficiencies enabled by a vertical merger reduce rivals' profits, possibly causing them to leave the industry. Exit is not required to establish harm. Nevertheless, if exit occurs, the welfare loss might increase substantially. This perspective provides a unified approach to evaluating horizontal and vertical mergers, which might be analyzed using similar standards.

Exit might fundamentally alter the welfare analysis of a vertical merger. Three relevant effects merit emphasis in this regard. First, exit might introduce a (discontinuous) reduction in *product variety*, which might have important welfare consequences for consumers.[16] Second, exit might (discontinuously) reduce the *competitive pressures* that active rivals can impose on large suppliers. The magnitude of this effect could depend on whether the rival who does not find it profitable to operate in the short run would return to the market if the merged firms increase their prices. The negative impact of exit is likely to be more pronounced in industries with entry barriers and concentrated industries, as we discuss in Section IV, *infra*. Finally, the third effect is related to the *probability of exit* noted above: some forces that arise under vertical integration (those that reduce the prices charged by non-integrated retail rivals) enhance welfare in the absence of exit but no longer enhance welfare if exit is induced. An exit-inducing vertical merger might reduce welfare even if it is a welfare-enhancing merger absent exit.

On the one hand, our theory of harm for vertical mergers does not require exclusionary (RRC, foreclosure) nor predatory conduct on the part of the merged firm. On the other hand, it does not preclude such conduct either. In other words, it is straightforward to allow for exclusionary and predatory conduct. Both theories of anticompetitive harm are complementary in our view. Because the presence of exclusionary or predatory conduct might raise rivals' costs, it further increases the probability that a rival might exit. Thus, both theories of harm ought to be considered by the Agencies as appropriate in the industries under consideration. We follow this approach when discussing the examples in Section II, *infra*.

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[14] *Supra* note 3.

[15] Assumptions (A2) and (A3), *infra.*

[16] When products are differentiated, additional variety potentially increases consumer welfare through better segmentation. In such cases, a reduction in product variety could generate a large decrease in consumer surplus. For a quantification, see, *e.g.*, Donna, Javier D., Pedro Pereira, Yun Pu, André Trindade, and Renan C. Yoshida (2021), "Direct-to-Consumer Sales and Bargaining," SSRN 3779962, https://dx.doi.org/10.2139/ssrn.3779962

The complexity of vertical mergers is also the principal reason why the Agencies should evaluate vertical mergers on a case-by-case basis, grounded on the specificities of the industries, transactions, and agents involved.

The idea that vertical integration might induce rivals' exit is not new.[17] Mainstream antitrust and economic scholars have long recognized that vertical integration and vertical schemes may harm horizontal rivals.[18] In the opening paragraph of Steven C. Salop and David T. Scheffman's classic Article, the authors state:

> "Conduct that unreasonably excludes competitors from the marketplace is a concern of antitrust law. Predatory pricing doctrine focuses on conduct that lowers revenues. Alternatively, a firm can *induce its rivals to exit* the industry by raising their costs. Some nonprice predatory conduct can best be understood as action that raises competitors' costs."[19] (Emphasis added.)

The VMGs, in turn, express:

> "In identifying whether a vertical merger may diminish competition due to unilateral foreclosure or raising rivals' costs, the Agencies generally consider whether the following conditions are satisfied: (1) Ability: By altering the terms by which it provides a related product to one or more of its rivals, the merged firm would likely be able to cause those rivals (a) to lose significant sales in the relevant market (for example, if they are *forced out of the market*; if they are deterred from innovation, entry, or expansion, or cannot finance those activities; or if they have incentives to pass on higher costs through higher prices) or (b) to otherwise compete less aggressively for customers' business."[20] (Emphasis added.)

A vertical merger might induce a rival to exit the market by precluding the rival from covering its operational costs.[21] This concept is embedded in the economic theory of exclusive dealing.[22]

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[17] See, for example, *Brown Shoe Co. v. U.S.*, 370 U.S. 294 (1962). We discuss this and other examples in Section II, *infra*.

[18] Phillip E. Areeda (late) and Herbert Hovenkamp (2015-2021) [1978], "Antitrust Law: An Analysis of Antitrust Principles and Their Application," ¶1000-¶1041, ¶1600-¶1619, ¶1800-¶1823, Fourth and Fifth Editions; Bork (1978), *supra* note 10, at 152-164 and 237-252; Motta, Massimo (2004), "Competition policy: theory and practice," chapter 6, Cambridge University Press; Rey, Patrick and Jean Tirole (2007), "A Primer on Foreclosure," in Handbook of Industrial Organization, Volume 3, edited by Mark Armstrong and Robert H. Porter, 2145-2220, DOI: 10.1016/S1573-448X(06)03033-0.

[19] Salop, Steven C., and David T. Scheffman (1983), "Raising Rivals' Costs," American Economic Review, vol. 73:2, 267–71, http://www.jstor.org/stable/1816853, at 267.

[20] VMGs, *supra* note 1, § 4a.

[21] Either by diverting demand, raising rivals' costs, foreclosure, or other means.

[22] See Eric B . Rasmusen, J. Mark Ramseyer, and John S. Wiley Jr., (1991), "Naked exclusion," American Economic Review, 1137-1145, https://www.jstor.org/stable/2006909; the subsequent comment by Ilya R. Segal and Michael D. Whinston (2000), "Naked Exclusion: Comment," American Economic Review, 90:1, 296-309, DOI: 10.1257/aer.90.1.296; and the extension by Chiara Fumagalli and Massimo Motta (2006), "Exclusive Dealing and Entry, when Buyers Compete," American Economic Review, 96:3, 785-795, DOI: 10.1257/aer.96.3.785. See also Howard P. Marvel, (1982), "Exclusive dealing," Journal of Law and Economics, 25:1, 1-25, DOI: 10.1086/467004; Bernheim, B. Douglas and Michael D. Whinston (1998), "Exclusive dealing," Journal of Political Economy, 106:1, 64-103, DOI: 10.1086/250003; and the references therein. By making it more difficult for a rival to cover its operational costs, a vertical merger may induce a rival out of the market in a similar way as an exclusive contract may make a rival's entry more difficult, thus imposing a negative externality. In the case of an exclusive contract, the incumbent may deter efficient entry; in the case of vertical integration investigated in this Article, the vertically integrated firm may induce rivals' exit. Using data from cement and ready-mixed concrete plants, Hortaçsu and Syverson (2007)

Therefore, while the possibility that a vertical merger may induce a rival out of the market is not new, the insight that vertical mergers which induce exit may be particularly harmful has been absent.

To understand why a vertical merger that induces exit might be particularly harmful, consider its horizontal harm. Start by considering a potential anticompetitive horizontal merger. Instead, suppose that a vertical merger induces the exit of the corresponding rival in the mentioned anti-competitive horizontal merger. Such a vertical merger could be very harmful to consumers and social welfare due to the three effects discussed, *supra*.[23] The elimination of a rival following a vertical merger can, therefore, be seen as horizontal harm.[24] We argue that such vertical mergers are more likely to be problematic and might, thus, require a particularly thorough evaluation.

The Article is organized as follows. In Section II, we begin by discussing examples about the concern of rivals' exit for vertical merger evaluation. Section III sets a common ground by introducing terminology and definitions. We then proceed to present the economic framework in Section IV. The discussion in Section V concludes. The technical details are in the Appendix.

II. Examples.

A. An old example: *Brown Shoe Co. v. U.S.*

Our first example discusses *Brown Shoe Co. v. U.S.*[25] The fundamental argument against the vertical merger between Brown Shoe Company, Inc. (Brown) and G. R. Kinney Company, Inc. (Kinney) arose from the possibility that it would likely induce the exit of unintegrated rivals, which might "substantially lessen competition," a § 7 violation of the Clayton Act.

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empirically study the market power effects of vertical integration on vertical foreclosure, including patterns of prices, productivity, entry, exit, and scale across integrated and unintegrated firms; see Hortaçsu, Ali and Chad Syverson (2007), "Cementing Relationships: Vertical Integration, Foreclosure, Productivity, and Prices," Journal of Political Economy, 115:2, 250-301, DOI: 10.1086/514347. Regarding countervailing buyer power that might keep input prices low, the predictions are sensitive as shown by Alberto Iozzi and Tommaso Valletti (2014), "Vertical bargaining and countervailing power," American Economic Journal: Microeconomics 6:3: 106-35, DOI: 10.1257/mic.6.3.106.

[23] Product variety, competitive pressures, and probability of exit.

[24] We are not the first to make such an interpretation. As Steven C. Salop states: "[A]n integrated incumbent can sometimes deprive an entrant of access to the most efficient technologies, thereby requiring the entrant to use a more costly production process. Placing the entrant at such a cost disadvantage may *induce it to exit* from the (downstream) product market, may deter its entry into that market, or may simply cause it to reduce his market share. In either event, the horizontal market power of the incumbent may be effectively increased, permitting it to raise the price of the product to consumers. Thus, although the predatory strategy is "vertical" in method, it is "*horizontal*" in effect." (Emphasis added.) Steven C. Salop (1981), "Strategy, predation, and antitrust analysis," Federal Trade Commission, Bureau of Economics, Bureau of Competition, Edited by Steven C. Salop (1981), at 26, (accessed March 2, 2022): https://books.google.com/books?id=LyW7AAAAIAAJ. For an early discussion, see the classic article by Phillip Areeda and Donald F. Turner (1975), "Predatory Pricing and Related Practices under Section 2 of the Sherman Act," Harvard Law Review, vol. 88:4, 697–733, DOI: 10.2307/1340237; the comment by Frederic M. Scherer (1976), "Predatory Pricing and the Sherman Act: A Comment," *Harvard Law Review*, 89:5, 869–890. DOI: 10.2307/1340183; and Areeda and Hovenkamp (1978), *supra* note 18.

The presence of predation is not necessary for the horizontal-harm interpretation in this paragraph, as noted by Bork (1978), *supra* note 10, at 244-245.

[25] *Brown Shoe Co. v. U.S.*, 370 U.S. 294 (1962).

In November 1955, the Government filed a civil lawsuit in the District Court for the Eastern District, alleging a § 7 violation of the Clayton Act[26] by the proposed merger between Brown and Kinney, whereby Brown would acquire Kinney's stock and assets. The lawsuit sought injunctive relief under § 15 of the Clayton Act.[27]

The Government argued that the merger would substantially lessen competition "by *eliminating* actual or potential competition in the production of shoes for the national wholesale shoe market and in the sale of shoes at retail in the Nation, by foreclosing competition [...] and by enhancing Brown's competitive advantage over other producers, distributors and sellers of shoes."[28] (Emphasis added.)

Brown contended that the merger would not substantially lessen competition because Kinney manufactured and retailed only a small share of the nationwide market of shoes, 0.5 and 2 percent, respectively.

The merger materialized on May 1, 1956. The District Court found that the merger was likely to "substantially lessen competition in manufacturers' distribution of [...] shoes" and, generally, in the retailing of shoes to consumers.[29] It ordered Brown to divest completely the Kinney acquisition.[30] The Supreme Court affirmed the District Court's judgment.

In 1955, Brown was the fourth-largest shoe manufacturer in the United States, producing approximately 4 percent of the nation's shoes. Brown was also involved in retailing, being the third-largest shoe retailer in the country, with over 1,230 outlets.[31] Kinney's primary activity was retailing. It was the eighth-largest retailer in the United States, with 1.2 percent of the nationwide shoe sales and over 350 stores. Kinney was the twelfth largest manufacturer of shoes, producing 0.5 percent of the countries' shoes.[32] Kinney was in charge of the largest independent chain of family shoe stores in the country. Before the merger, Kinney's purchased and sold shoes from other manufacturers. While Brown sold no shoes to Kinney before the merger, it became Kinney's largest outside seller by 1957.[33]

Many manufacturers and retailers operated in the United States shoe industry at the time of the merger. At the manufacturer level, the production of the 4 (alternatively, 24) largest manufacturers was about 23 (35) percent of the total nationwide shoes.[34] Nevertheless, as emphasized, *supra*, neither of the two companies involved in the merger were small. It was agreed that the relevant geographic market was the entire nation.

As indicated by the amendment to Section 7 of the Clayton Act in 1950, Congress was concerned at this time with the "rising tide of economic concentration" in the American economy. Congress sought to provide authority to arrest "mergers at a time when the trend to a lessening of

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[26] 15 U.S.C. § 18.

[27] 15 U.S.C. § 25.

[28] *Brown Shoe Co. v. U.S.*, 370 U.S. 294 (1962), at 297.

[29] *Brown Shoe Co. v. U.S.*, 370 U.S. 294 (1962), at 299.

[30] *Brown Shoe Co. v. U.S.*, 370 U.S. 294 (1962), at 304.

[31] The District Court reported a vertical-concentration trend in the shoe industry, whereby manufacturers had been acquiring retailers. Brown disposed of its own outlets by 1945. During the 1951-1954 period, Brown acquired several small retailers and manufacturers. *Brown Shoe Co. v. U.S.*, 370 U.S. 294 (1962), at 301-302.

[32] *Brown Shoe Co. v. U.S.*, 370 U.S. 294 (1962), at 297 and 303.

[33] *Brown Shoe Co. v. U.S.*, 370 U.S. 294 (1962), at 303-304.

[34] *Brown Shoe Co. v. U.S.*, 370 U.S. 294 (1962), at 300.

competition in a line of commerce was still in its incipiency."[35] The Supreme Court stated: "Taken as a whole, the legislative history illuminates congressional concern with the protection of *competition*, not *competitors*, and its desire to restrain mergers only to the extent that such combinations may tend to lessen competition."[36] (Emphasis in original.) Congress wanted to preclude the formation of oligopolies in healthy, competitive industries.

Brown contended that its manufactured mid-priced shoes did not compete with the retailed low-priced shoes from Kinney. The District Court found the facts otherwise: medium- and low-priced shoes did not constitute distinct product markets; they were part of the same market. The Supreme Court agreed.[37]

For the shoe industry, composed of a large number of firms upstream and downstream, "Congress appeared anxious to preserve this structure."[38] Foreclosure might impose "a potential clog on competition"[39] which may substantially lessen competition. The main objection to the vertical integration of Brown-Kinney was that it might induce unintegrated rivals to exit the market, particularly small, independent shoe manufacturers who supplied Kinney prior to the merger:

> "[A] significant aspect of this merger is that it creates a large national chain which is integrated with a manufacturing operation. The retail outlets of integrated companies, by *eliminating wholesalers* and by increasing the volume of purchases from the manufacturing division of the enterprise, can market their own brands at prices below those of competing independent retailers. Of course, some of the results of large integrated or chain operations are beneficial to consumers. Their expansion is not rendered unlawful by the mere fact that *small independent stores may be adversely affected*. It is competition, not competitors, which the Act protects. But we cannot fail to recognize Congress' desire to *promote competition through the protection of viable, small, locally owned businesses*. Congress appreciated that occasional higher costs and prices might result from the maintenance of fragmented industries and markets. It resolved these competing considerations in favor of decentralization. We must give effect to that decision."[40] (Emphasis added.)[41]

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[35] *Brown Shoe Co. v. U.S.*, 370 U.S. 294 (1962), at 317.

[36] *Brown Shoe Co. v. U.S.*, 370 U.S. 294 (1962), at 320. Chief Justice E. Warren masterful discussion of the legislative history regarding the alleged Section 7 violation of the Clayton Act as the section was amended in 1950 is worth reading in its entirety.

[37] *Brown Shoe Co. v. U.S.*, 370 U.S. 294 (1962), at 326.

[38] *Brown Shoe Co. v. U.S.*, 370 U.S. 294 (1962), at 333.

[39] *Standard Oil Co. of California v. United States*, 337 U. S. 293, at 314.

[40] *Brown Shoe Co. v. U.S.*, 370 U.S. 294 (1962), at 344.

[41] Justice J. Harlan adds: "Since Brown is able by reason of this merger to turn an independent purchaser into a captive market for its shoes it inevitably diminishes the available market for which shoe manufacturers compete. If Brown shoes replace those which had been previously produced by others, the displaced manufacturers have no choice but to enter some other market or *go out of business*. Since all manufacturers, including Brown, had competed for Kinney's patronage when it was unaffiliated, Brown's merger with Kinney potentially *withdraws* a share of the market previously available to the independent shoe manufacturers." (Emphasis added.) *Brown Shoe Co. v. U.S.*, 370 U.S. 294 (1962), at 372.

Regarding retailers, Justice J. Harlan adds: "[The Brown-Kinney merger] may also adversely affect competition on the retailing level. […] As a manufacturer-owned outlet, the Kinney store would doubtless be able to sell its shoes at a lower profit margin and *outlast* an independent competitor." (Emphasis added.) *Brown Shoe Co. v. U.S.*, 370 U.S. 294 (1962), at 372-373.

Justice J. Harlan also concludes that the resulting harm to competition is likely to be substantial: "When, as here, the foreclosure of what may be considered a small percentage of retailers' purchases may be caused by the combination

As discussed, *supra*, rivals' exit generates horizontal harm:

> "Although these mergers have been primarily vertical in their aim and effect, to the extent that they have brought ever greater numbers of retail outlets within *fewer and fewer hands*, they have had an additional important impact on the horizontal plane."[42] (Emphasis added.)

B. Distribution foreclosure.

Our second example refers to distribution foreclosure. We discuss the proposed Comcast/TWC transaction in 2015 following the analysis in Rogerson (2018).[43,44]

In the proposed transaction, Comcast Corporation (Comcast)—the largest provider of cable, Internet, and pay-TV services in the United States—was attempting to purchase Time Warner Cable Inc. (TWC)—the second-largest cable, the third-largest Internet provider, and fourth-largest pay-TV company in the United States.

At the time of the transaction, Online Video Distributors (OVDs) were beginning to emerge.[45] Examples of OVDs include Netflix, Sling TV, Amazon Video, and Hulu. OVDs were small, limiting their ability to compete effectively with traditional pay-TV services. For instance, Netflix, an

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of the country's third largest seller of shoes with the country's largest family-style shoe store chain, and when the volume of the latter's purchases from independent manufacturers in various parts of the country is large enough to render it probable that these suppliers, if displaced, will have to *fall by the wayside*, it cannot, in my opinion, be said that the effect on the shoe industry is 'remote' or 'insubstantial.'" *Brown Shoe Co. v. U.S.*, 370 U.S. 294 (1962), at 373.

[42] *Brown Shoe Co. v. U.S.*, 370 U.S. 294 (1962), at 345.

[43] Rogerson, William P. (2018), "Economic Theories of Harm Raised by the Proposed Comcast/TWC Transaction (2015)," in "The Antitrust Revolution: Economics, Competition, and Policy," edited by John E. Kwoka, Jr. and Lawrence J. White, 7th Edition, Oxford University Press, 423-447.

[44] For additional details, see Carlton, Dennis W. (2014), "Declaration of Dennis W. Carlton," Submitted by Comcast Corp. and Time Warner Cable Inc., *In the Matter of Applications of Comcast Corp. And Time Warner Cable Inc. For Consent to Transfer Control of Licenses and Authorizations*, FCC MB-Docket 14-57, September 22; Israel, Mark (2014a), "Implications of the Comcast/Time Warner Cable Transaction for Broadband Competition," Submitted by Comcast Corp. and Time Warner Cable Inc., *In the Matter of Applications of Comcast Corp. And Time Warner Cable Inc. For Consent to Transfer Control of Licenses and Authorizations*, FCC MB-Docket 14-57, April 8; Israel, Mark A. (2014b), "Economic Analysis of the Effect of the Comcast-TWC Transaction on Broadband: Reply to Commenters," Submitted by Comcast Corp. and Time Warner Cable Inc., *In the Matter of Applications of Comcast Corp. And Time Warner Cable Inc. For Consent to Transfer Control of Licenses and Authorizations*, FCC MB-Docket 14- 57, September 22; Rogerson, William P. (2014), "A Vertical Merger in the Video Programming Industry and Distribution Industry: Comcast-NBCU (2011)," in "The Antitrust Revolution: Economics, Competition, and Policy," edited by John E. Kwoka, Jr. and Lawrence J. White, 6th Edition, Oxford University Press, 534-575; Rosston, Gregory L. and Michael D. Topper (2014a), "An Economic Analysis of the Proposed Comcast/Time Warner Cable Transaction," Submitted by Comcast Corp. and Time Warner Cable Inc., *In the Matter of Applications of Comcast Corp. And Time Warner Cable Inc. For Consent to Transfer Control of Licenses and Authorizations*, FCC MB- Docket 14-57, April 8; Rosston, Gregory L. and Michael D. Topper (2014b), "An Economic Analysis of the Proposed Comcast Transactions with TWC and Charter in Response to Comments and Petitions," Submitted by Comcast Corp. and Time Warner Cable Inc., *In the Matter of Applications of Comcast Corp. And Time Warner Cable Inc. For Consent to Transfer Control of Licenses and Authorizations*, FCC MB-Docket 14-57, September 20; Sappington, David (2014), "Reply Declaration of David Sappington," Submitted by DISH Network Corporation, *In the Matter of Applications of Comcast Corp. And Time Warner Cable Inc. For Consent to Transfer Control of Licenses and Authorizations*, FCC MB- Docket 14-57, December 22.

[45] The Federal Communication Commission (FCC) defined OVDs as: "any entity that offers video content by means of the Internet or other Internet Protocol (IP)-based transmission path provided by a person or entity other than the OVD." Federal Communications Commission (2015), "Annual Assessment of the Status of Competition in the Market

early OVD, was offering only limited on-demand material. Other entrants in the OVD market were not well-established. To operate, OVDs needed a key input provided by Comcast and TWC: internet distribution services.[46] OVDs needed the Internet networks of cable providers to distribute their content to the consumers.

Comcast and TWC argued that the transaction would not directly reduce competition in the retail pay-TV or in Internet access service markets because the companies served different geographic areas. The Agencies considered that the development of the OVDs market was welfare-enhancing for consumers. Comcast and TWC had the ability to preclude or degrade internet distribution services for OVDs. The Agencies were concerned that OVDs may face distribution foreclosure by Comcast or TWC.

The Agencies feared that such foreclosure could stymie the nascent OVDs market. As noted by William P. Rogerson:

> "The transaction was proposed at a time when OVDs were just beginning to emerge as potentially significant new competitors to the traditional providers of pay-TV services and were thus *particularly vulnerable* to attempts by traditional competitors to disadvantage them. Cable companies were significant players in the [market] where OVDs purchased their […] interconnection to last-mile Internet access services."[47] (Emphasis added.)

Steven C. Salop stresses the exit aspect in such foreclosure:

> "This foreclosure can lead to one or more upstream suppliers *exiting* or reducing investment, thereby permitting the upstream merging firm to exercise market power. In the Comcast-Time Warner Cable proposed merger, one concern was that an OVD's failure to obtain distribution on either Comcast or Time Warner Cable would *reduce its likelihood of survival*."[48] (Emphasis added.)

C. Intermediary foreclosure.

Our following example discusses intermediary foreclosure.

We consider the United States domestic airline industry. Scott Morton *et al.* (2015) report that 44 percent of passengers who book online use metasearch travel engines (MTEs) or online travel agencies (OTAs).[49] Examples of MTEs are Fly.com, Google Flights, Kayak, and TripAdvisor;

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for the Delivery of Video Programming", Document 80 FR 44106, Agency/Docket Numbers: MB Docket No. 15-158 DA 15-784, Document Number: 2015-18215, Publication Date: 07/24/2015. Available at (accessed on February 15, 2022): https://www.federalregister.gov/d/2015-18215

[46] Another OVD input provided by Comcast and TWC was programming. Rogerson (2018), *supra* note 43, at 424.

[47] Rogerson (2018), *supra* note 43, at 445.

[48] Salop (2018), *supra* note 61, at 1976. Salop adds: "The result of this threat to their survival raised the bargaining power of the merging firms, which could permit them to charge higher interconnection prices, which then raises the costs of the OVDs. In this way, it can lead to input foreclosure effects."

[49] The number is based on a survey of travelers purchasing airline tickets from a 2014 Phocuswright report (Scott Morton *et al.* 2015 at 2). The authors also report results from a different survey, where 89 percent of the respondents indicated that they searched using OTAs or MTEs "sometimes," "most of the time," or "always" prior to booking through the airline (Scott Morton *et al.* 2015 at 8). See Scott Morton, Fiona, R. Craig Romaine, and Spencer Graf (2015), "Benefits of preserving consumers' ability to compare airline fares," Washington DC: Travel Technology Association and Charles River Associates, CRA Project No. D20563-00. Available at (accessed on September 13, 2022): https://skift.com/wp-content/uploads/2015/05/CRA.TravelTech.Study_.pdf

examples of OTAs include CheapOair, Expedia, Orbitz, and Priceline. The United States domestic airline industry is quite concentrated;[50] the supply-side is characterized by high fixed costs and substantial barriers to entry. MTEs and OTAs act as intermediaries in the airline industry. They provide information to consumers about the prices and schedules of multiple airlines; they allow consumers to compare prices and itineraries, thereby reducing search costs and improving consumer welfare.[51] Consumer search costs are high in the airline industry due to frequent changes in airfares and itineraries. Higher search costs might allow airlines to charge higher prices.[52]

Imagine the case where, following a merger, a leading, major airline forecloses MTEs and OTAs.[53] Such foreclosure can be readily implemented by the airline by restricting access to its ticket fares and itineraries. Consider the case of the city-pair markets served by a few airlines; for example, one can think about city pairs served only by the leading airline, another major carrier, and one or two small regional carriers.[54]

By restricting MTEs and OTAs fare access, the major airline hinders consumers' ability to compare prices and might reduce competition. Travelers have to navigate to the airline's website, which does not include rivals' fares.[55] There is an increase in the cost of searching for fares and itineraries.[56] The increase in search costs benefits the major airline to the detriment of the regional carriers: passengers are more likely to choose the major carrier because they might not know about

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[50] While there are several airlines in the United States domestic market, the four largest carriers—American Airlines, Inc., Delta Air Lines, Inc., Southwest Airlines, and United Airlines Holdings, Inc.—control most of the passengers. The combined market share of the four largest carriers in terms of tickets sold was approximately 80 percent from 2005-2014 (Scott Morton *et al.* 2015, Table 5). The concentration issue is exacerbated for individual passengers. These passengers are typically interested in flying between two cities. However, for the immense majority of city pairs, few, often only one or two, carriers offer the service. Approximately 97 percent of city pairs are highly concentrated (HHIs above 2,500 using the definition by the DOJ) and more than half have HHIs above 4,000 (Scott Morton *et al.* 2015, Table 4). While some city pairs refer to small cities, "nearly 90 percent of all passengers traveled on [city pairs] with HHIs above 2,500, and about 40 percent of [city pairs] have HHIs in excess of 4,000" (Scott Morton *et al.* 2015, at 36). Brueckner *et al.* (2014) discuss multiple airport cities. See Brueckner, Jan K., Darin Lee, and Ethan Singer (2014), "City-Pairs vs. Airport-Pairs: A Market-Definition Methodology for the Airline Industry," Review of Industrial Organization, 44, 1-25; and Scott Morton *et al.* (2015), *supra* note 49.

[51] OTAs and MTEs also provide other services to consumers, like itineraries involving multiple airlines, price tracking information and price alerts, and information about flight amenities and complementary products, such as rental cars and lodging. OTAs might also charge a margin for their services. In the absence of market power, intermediaries improve consumers' welfare when they provide additional services; when market power is present, intermediaries may also lead to double marginalization. Donna *et al.* (2022a) quantify the welfare of intermediaries in oligopolistic markets, where intermediaries offer search services to consumers. See Javier D. Donna, Pedro Pereira, Tiago Pires, André Trindade (2022a), "Measuring the Welfare of Intermediaries," Management Science, 1-57, DOI: 10.1287/mnsc.2021.4266.

[52] Southwest Airlines provides a case study, as it has typically foreclosed OTAs and MTEs. Bilotkach (2010) documents that the airfares charged by Southwest Airlines tend to be similar to or higher than the comparable airfares offered by its rivals. See Volodymyr Bilotkach (2010), "Reputation, Search Cost, and Airfares," Journal of Air Transport Management, 15:5, 251–257, DOI: 10.1016/j.jairtraman.2010.01.002

[53] The intermediary foreclosure could arise due to a vertical merger between the major airline and an OTA, a horizontal merger between two airlines, or, absent merger, as a strategy by the major airline to gain market power.

[54] This is a common situation in the United States domestic industry as discussed in footnote 50, *supra*.

[55] Asking consumers to sign in to the airline website to search might also allow the airline to use consumer personal information to price discriminate and to charge ancillary fees for preferential seating assignments, priority boarding, and additional carry-on luggage space.

[56] Donna *et al.* (2022a) document that a moderate increase in search costs generates a decrease in consumer surplus comparable to a large increase in market power. See Donna *et al.* (2022a), *supra* note 51.

the lower fares offered by the regional carrier.[57] Some consumers[58] who would have chosen the regional carrier due to its lower fares will choose the major carrier when there is no price comparison information from the MTEs and OTAs.[59] There is a decrease in the regional carrier demand. Now the regional carrier might not be able to cover its fixed costs, and it might exit the city-pair market. Competition might be substantially lessened in the city-pair market; continuing with the example in the previous paragraph, it might reduce the number of competitors in the city pair from 4 to 3 or 3 to 2. Consumer and social welfare might decline. As Scott Morton *et al.* (2015) argue:

> "[T]his combination of airline concentration with heightened attempts to lead travelers away from OTAs and [MTEs] is likely to lead to higher average airfares, increase consumers' search costs, *make entry into city-pair routes by smaller airlines more difficult*, reduce transparency, and strengthen the market power of the major airlines."[60] (Emphasis added.)

D. Customer foreclosure.

Our fourth example refers to customer foreclosure and is taken from Salop (2018).[61]

Consider the case of a dominant hospital acquiring a key anesthesiology practice. Imagine the situation where, before the acquisition, the dominant hospital uses (or refers patients to) several anesthesiologist practices, but after the acquisition, only uses the acquired practice. That is, the dominant hospital stops using unaffiliated anesthesiologist practices. Imagine further that such conduct leads some competing anesthesiology practices to exit the market.[62] "This customer foreclosure could permit the acquired anesthesiology group to gain market power over smaller competing hospitals and clinics. Customer foreclosure also could lead to input foreclosure effects, allowing the merging hospital to increase its prices."[63]

Similarly, input foreclosure may lead to exit in the hospital market. Suppose that the acquired anesthesiology practice stops providing services or stops referring clients to other smaller hospitals

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[57] George J. Stigler (1961), "The Economics of Information," Journal of Political Economy, 69:3, 213-225, DOI: 10.1086/258464.

[58] Those with high search costs.

[59] Scott Morton *et al.* (2015) also document instances where the airlines indicated their intent to charge intermediaries. The authors use a Walmart analogy:

> "What the airlines appear to be attempting would be like entering a Walmart store and seeing half empty shelves with no prices shown. To get the prices to show the customer, Walmart has to pay the manufacturers to turn on the shelf tags. The empty spaces on the shelves belong to manufacturers whose products are not displayed at all. In order for the customer to compare prices on those products, the customer must leave and enter a specific manufacturer's store down the street to see their products and prices. Indeed, it is difficult to think of an industry that charges consumers for simply viewing their prices and product offerings." Scott Morton *et al.* (2015), *supra* note 49, at 29.

[60] Scott Morton *et al.* (2015), *supra* note 49, at 3.

[61] Salop, Steven C. (2018), "Invigorating Vertical Merger Enforcement," The Yale Law Journal, 127:7, 1962–1994, at 1969. http://www.jstor.org/stable/45222589

[62] This outcome would be unlikely if the rival practice has other characteristics (*e.g.*, physicians, capital, or other services) that differentiate it from the practice of the vertically integrated hospital. In other words, rivals' exit concerns are not paramount when the unintegrated practice is not a close competitor to the acquired practice. The potentially harmful cases are the ones where the services offered by the unintegrated and acquired practices are similar from the consumers' perspective.

[63] Salop (2018), *supra* note 61, at 1969-1970. *Customers* refer to the patients in the example. The dominant hospital relies exclusively on the acquired anesthesiology practice.

that compete with the dominant hospital. In such cases, smaller hospitals may exit the market, allowing the dominant hospital to increase its prices.

E. Complementary goods.

The following example refers to a complementary-good merger.[64,65] Mergers of complementary goods can be analyzed using the same economic principles as vertical mergers.[66]

Consider the case where a retailer of fertilizers acquires a seeds retailer. Fertilizers and seeds are complements and are sold to retailers by non-integrated manufacturers. Imagine the case where the fertilizer retailer is a large, diversified, and well-established dominant firm that retails several products. The seeds retailer is smaller than the fertilizer retailer but still a dominant firm in the seeds market, where there are a few smaller rivals.

Next, we discuss the theories of benefit and harm and show that our vertical-merger framework applies. Consider, first, the elimination of double marginalization (EDM). Before the acquisition, if there is market power, each retailer independently maximizes its profits and charges a price above its marginal cost. The seeds' fertilizer retailer does not incorporate in its pricing decision the effect on the profit of the seed's retailer, and vice versa. While the increase in the price of fertilizers reduces the demand for fertilizer, it also reduces the demand for seeds. The fertilizer retailer does not internalize the latter effect. Similarly, for the retailer of seeds. After the acquisition, the merged firm maximizes the joint profit of its two complementary products—fertilizers and seeds—and internalizes the decrease in sales of seeds caused by an increase in the fertilizer price. Hence, the merged firm sets a price equal to its marginal cost for the fertilizer product. The decrease in the price of fertilizer reduces the marginal cost of the seed product of the merged firm. It allows the merged firm to charge a lower price for seeds. Rival firms may respond by lowering their prices. If there is no exit, consumer and social welfare increase. Yet some rivals might not be able to cover the fixed costs and might exit the market. Competition might be substantially lessened, and consumer and social welfare might decline, even in the absence of *any* exclusionary behavior.[67]

Now, consider what might happen if, in addition to the analysis, *supra*, there is exclusionary behavior, RRC, or foreclosure. Before the acquisition, both retailers purchase the products from non-integrated manufacturers. Consider the case where, after the acquisition, the upstream, non-integrated manufacturers of seeds are induced to give preferential treatment—for example, in terms of delivery times, quality, price, or availability of the seeds—to the seed's retailer of the merged firm, perhaps due to fear of retaliation by the large fertilizer retailer because this firm also sells other products to the consumers. Alternatively, suppose that the merged retailer underprices the seeds of the merged firm—for example, using revenues from its other products—to gain market

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[64] *Infra* note 88 provides an example. See Section III, *infra*, for a definition of complementary goods.

[65] While the modeling of complementary-product and vertical mergers may differ depending on the specificities of the industries, both types of mergers involve similar theories of benefits and harms. Therefore, the framework developed in Section IV can be used to analyze complementary-product mergers.

[66] See, *e.g.*, Salop (2018), *supra* note 61, at 1990-1991.

[67] See Section III, *infra*, for a definition of exclusionary behavior.

share in the seeds market.[68] In these cases, the conduct of the merged firms might foreclose, exclude, or raise the costs of the rivals in the seeds market. It might, therefore, further induce the exit of seeds retailers from the industry. Social and consumer welfare *might* be further reduced.[69]

F. Another old example: Revisiting *one* of the concerns in *FTC v. Procter & Gamble Co.*

Our last example discusses how the fundamentals from the previous example about complementary goods apply to a product-extension merger. We examine one of the concerns contained in the Supreme Court's Opinion in *FTC v. Procter & Gamble Co.*[70]

Note that this is a product-extension merger, not a vertical merger. Nevertheless, one of the concerns in *FTC v. Procter & Gamble Co.* was that the merger "may substantially reduce the competitive structure of the industry […] by dissuading the smaller firms from aggressively competing"[71] and make "the few small firms that have not disappeared through merger eventually *falling by the wayside*."[72] (Emphasis added.)

In other words, there was a concern that the merger might drive unintegrated rivals out of the market *due to the complementary nature* of the merging firms' products, as discussed *infra*. This concern relates to the basic principle discussed throughout the paper: that a vertical merger might induce the exit of unintegrated rivals.[73] The reason is simple: the same economic principles govern vertical and complementary-product mergers, as discussed in example E, *supra*.

For this reason, in this example, we only focus on *one* of the anticompetitive effects raised in the case: the concern that the merged firm may induce the exit of rivals in the complementary-

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[68] *Underpricing* refers to setting a price below the level that would maximize the firm's profit in the absence of an exit by a rival.

[69] See also *infra* note 124.

[70] *FTC v. Procter & Gamble Co.*, 386 U.S. 568 (1967).

[71] *FTC v. Procter & Gamble Co.*, 386 U.S. 568 (1967), at 578.

[72] *FTC v. Procter & Gamble Co.*, 386 U.S. 568 (1967), at 578.

[73] For a vertical merger, our framework shows the concern that arises when the integrated firm may drive a downstream rival out of business. Such framework applies *vis-à-vis* to product-extension merger in which the product from the acquiree firm is a complement to a product from the acquiring firm, and there is concern that the transaction/merger may drive out of business rivals of the acquiree firm. See *supra* notes 64 and 66.

good market—liquid bleach—by retaliation, foreclosure, or using revenue from its other products to underprice the acquired complementary good, Clorox.[74,75]

Procter & Gamble Co (P&G) acquired Clorox Chemical Co. (Clorox) in 1957. P&G was a dominant, large, multiproduct manufacturer of household products. P&G's principal products were soaps, detergents, and cleansers. The market for packaged detergent was quite concentrated at the manufacturer level. P&G was the dominant firm with 54 percent of sales.[76] The three largest firms accounted for 80 percent of sales. P&G did not manufacture liquid bleach at the time of the acquisition.

Clorox was smaller than P&G but was the leading manufacturer of household liquid bleach. Clorox was the only national seller of liquid bleach.[77] It was responsible for 49 percent of the national sales. The liquid bleach industry was also quite concentrated at the manufacturer level. Clorox and its closest rival, Purex, accounted for 65 percent of the sales. Clorox, Purex, and other four firms accounted for about 80 percent of sales. The remaining 20 percent was manufactured by about 200 small, fringe manufacturers.

Liquid bleach is a home germicide and disinfectant. There were no close substitutes to liquid bleach at the time of the proposed merger. Consumers purchased liquid bleach from retailers, like grocery stores and supermarkets. Consumer prices for liquid bleach were low. The industry had high turnover. Crucially, households used liquid bleach as a whitening agent in washing clothes and fabrics. This feature made P&G's packed detergents and Clorox' liquid bleach complementary goods. As the Court stated, quoting the FTC report:

> "Packaged detergents—Procter's most important product category—and household liquid bleach are used *complementarily*, not only in the washing of clothes and fabrics, but also in general household cleaning, since liquid bleach is a germicide and disinfectant as well

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[74] There was concern about four anticompetitive effects:

"(a) In this oligopolistic industry the substitution of the powerful acquiring firm for the smaller but dominant firm may substantially reduce the competitive structure of the industry by dissuading the smaller firms from competing aggressively, resulting in a more rigid oligopoly with Procter the price leader. P.578.

"(b) The acquisition may also tend to raise the barriers to new entrants who would be reluctant to face the huge Procter, with, its large advertising budget. P. 579.

"(c) Potential economies cannot be used as a defense to illegality, as Congress struck the balance in favor of protecting competition. P. 580.

"(d) The FTC's finding that the acquisition eliminated Procter, the most likely entrant into the liquid bleach field, as a potential competitor, was amply supported by the evidence. Pp. 580-581." *FTC v. Procter & Gamble Co.*, 386 U.S. 568 (1967), at 569.

As mentioned, in this example, we *only* focus on the concern contained in point (a), that the merger "may substantially reduce the competitive structure of the industry […] by dissuading the smaller firms from aggressively competing; […]." *FTC v. Procter & Gamble Co.*, 386 U.S. 568 (1967), at 578. As we explain (pp. 16-16, *infra*), a matter under consideration was that rivals may exit in the liquid bleach market, as stated by the Court summarizing the FTC's report: "There was also the danger that Procter might underprice Clorox in order to *drive out competition*, and subsidize the underpricing with revenue from other products." (Emphasis added.) *FTC v. Procter & Gamble Co.*, 386 U.S. 568 (1967), at 575.

[75] See p. 16, *infra*.

[76] This number and the other figures and assertions reported in this example are obtained from the Supreme Court's Opinion. *FTC v. Procter & Gamble Co.*, 386 U.S. 568 (1967).

[77] It was not possible to ship liquid bleach more than 300 miles from its manufacturer due to high shipping costs and relatively low prices for bleach. It was determined that the relevant market was the nation and the relevant local markets. Clorox had 13 plants throughout the Nation. Purex's bleach was available in less than 50 percent of the Nation. Most fringe firms had only one plant and were thus limited to selling only in local markets.

as a whitener. From the consumer's viewpoint, then, packaged detergents and liquid bleach are *closely related products*. But the area of relatedness between products of Procter and of Clorox is wider. Household cleansing agents in general, like household liquid bleach, are low-cost, high-turnover household consumer goods marketed chiefly through grocery stores and pre-sold to the consumer by the manufacturer through mass advertising and sales promotions. Since products of both parties to the merger are sold to the same customers, at the same stores, and by the same merchandising methods, the possibility arises of significant integration at both the marketing and distribution levels."[78] (Emphasis added.)

All liquid bleach was chemically identical, thus making it a homogeneous product. Advertising was considered fundamental for liquid-bleach sales. Advertising was also vital to promoting soaps, detergents, and cleansers. P&G had a large advertising budget, over 80 million dollars. This budget allowed P&G to receive important discounts from media owners and media groups.

Favorably quoting the FTC's "painstaking and illuminating report,"[79] the Supreme Court's Opinion summarized the concern in the FTC's report that the acquisition may affect the structure of the industry by driving small fringe producers out of the market, which may substantially lessen competition:

> "[t]he practical tendency of the ... merger ... is to transform the liquid bleach industry into an arena of big business competition only, with the few small firms that have not disappeared through merger eventually *falling by the wayside*, unable to compete with their giant rivals."[80] (Emphasis added.)

There were three channels that may induce the exit of fringe producers, as stated by the Court summarizing the FTC's report:

> "[1. Retaliation.] The Commission found that the substitution of Procter with its huge assets and advertising advantages for the already dominant Clorox would dissuade new entrants and discourage active competition from the firms already in the industry due to fear of retaliation by Procter. [2. Foreclosure.] The Commission thought it relevant that retailers might be induced to give Clorox preferred shelf space since it would be manufactured by Procter, which also produced a number of other products marketed by the retailers. [3. Underpricing.] There was also the danger that Procter might underprice Clorox in order to *drive out competition*, and subsidize the underpricing with revenue from other products."[81] (Emphasis added.)

The Court treated such behavior harshly because it could dissuade the fringe firms from competing:

> "The anticompetitive effects with which this product-extension merger is fraught can easily be seen: [the merger] may substantially reduce the competitive structure of the industry by raising entry barriers and by *dissuading the smaller firms from aggressively competing* […]"[82] (emphasis added),

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[78] *FTC v. Procter & Gamble Co.*, 386 U.S. 568 (1967), at 575.
[79] *FTC v. Procter & Gamble Co.,* 386 U.S. 568 (1967), at 570.
[80] *FTC v. Procter & Gamble Co.*, 386 U.S. 568 (1967), at 575.
[81] *FTC v. Procter & Gamble Co.*, 386 U.S. 568 (1967), at 575.
[82] *FTC v. Procter & Gamble Co.*, 386 U.S. 568 (1967), at 578.

a violation of Section 7 of the Clayton Act.[83] In this regard, the Court stated that it was appropriate to call into play Section 7 of the Clayton Act, even if the anticompetitive power has not yet manifested because the section deals only with probabilities, not with certainties:[84]

> "Section 7 of the Clayton Act was intended to arrest the anticompetitive effects of market power in their incipiency. The core question is whether a merger may substantially lessen competition, and necessarily requires a prediction of the merger's impact on competition, present and future. See *Brown Shoe Co. v. United States*, 370 U. S. 294; *United States v. Philadelphia National Bank*, 374 U. S. 321. The section can deal only with probabilities, not with certainties. *Brown Shoe Co. v. United States*, *supra*, at 323; United States v. Penn-Olin Chemical Co., 378 U. S. 158. And there is certainly no requirement that the anticompetitive power manifest itself in anticompetitive action before § 7 can be called into play. If the enforcement of § 7 turned on the existence of actual anticompetitive practices, the congressional policy of thwarting such practices in their incipiency would be frustrated."[85]

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[83] "No person engaged in commerce or in any activity affecting commerce shall acquire, directly or indirectly, the whole or any part of the stock or other share capital and no person subject to the jurisdiction of the Federal Trade Commission shall acquire the whole or any part of the assets of another person engaged also in commerce or in any activity affecting commerce, where in any line of commerce or in any activity affecting commerce in any section of the country, the effect of such acquisition may be substantially to lessen competition, or to tend to create a monopoly." 15 U.S.C. § 18.

[84] Justice J. Harlan, in his concurring opinion, questions the rationale of the Court. He considered it a difficult case and called for a "refined analysis […] before putting the stamp of approval on what the Commission has done in this case," stating that the Court's approach "has almost become a kind of *res ipsa loquitur* approach to antitrust cases." *FTC v. Procter & Gamble Co.*, 386 U.S. 568 (1967), at 582. In particular, Justice J. Harlan questioned whether it is "reasonably probable" that fringe firms would compete less aggressively and, even in that case, whether the decreased competition is the "substantial" demanded by § 7:

> "The Court, however, does not indicate exactly what reasons lie behind this assumption or by what standard such an effect is deemed "reasonably probable." It could equally be assumed that smaller firms would become more aggressive in competing due to their fear that otherwise Procter might ultimately absorb their markets and that Procter, as a new entrant in the bleach field, was vulnerable to attack. […] Moreover, even if an effect of this kind were reasonably predictable, the Court does not explain why the effect on competition should be expected to be the substantial one that § 7 demands." *FTC v. Procter & Gamble Co.*, 386 U.S. 568 (1967), at 584.

Justice J. Harlan later adds:

> "At the outset, it seems to me that there is a serious question whether the state of our economic knowledge is sufficiently advanced to enable a sure-footed administrative or judicial determination to be made a priori of substantial anticompetitive effect in mergers of this kind." *FTC v. Procter & Gamble Co.*, 386 U.S. 568 (1967), at 587.

The framework presented in Section IV provides such rationale and answers both questions. First, a vertical merger that eliminates a rival may be more harmful than the corresponding anti-competitive horizontal merger. Second, (the possibility of) rivals' exit due to a vertical merger can be conceptualized as horizontal harm. Our framework provides a rationale for such a possibility and allows us to measure its welfare effects. The resulting horizontal harm is part of the economic theory of exclusive dealing (*supra*, note 22).

[85] *FTC v. Procter & Gamble Co.*, 386 U.S. 568 (1967), at 577. See also *Brown Shoe Co. v. U.S.*, 370 U.S. 294 (1962), at 323, discussed, in example A, *supra*.

III. Terminology and definitions

We focus our analysis on concentrated industries in which firms sell differentiated products.[86]

Two products are *(gross) substitutes* if the increase in the price of one of them raises the demand for the other.[87] Two products are *(gross) complements* if the increase in the price of one of them reduces the demand for the other.[88]

A *horizontal merger* combines firms that compete on the same level of production or distribution. A *vertical merger* combines firms that operate at different levels of production or distribution.[89] Firms are *rivals* if they produce substitute products.[90]

We refer to the activity level closest to final consumers as the *downstream level* (that is, the level of distribution, of retail, or of manufacture of final goods), and to the activity level furthest from final consumers as the *upstream level* (that is, the level of supply, of wholesale, or of manufacture of production factors). We refer to an upstream firm as a *wholesaler* and a downstream firm as a *retailer*.[91] The product of a wholesale firm is a *wholesale product*, and the product of a retail firm is a *retail product*. We adopt the corresponding terminology for other elements of industry activity, such as price, marginal cost, and profit.

We define a product as a combination of wholesaler and retailer. Hence, a product of a wholesaler sold to two distinct retailers are two different wholesale products, and the products of two distinct wholesalers sold by the same retailer are two different retail products.[92]

The increase of the price of a product decreases the sales of that product, and increases the sales of the alternative products, as consumers substitute their purchases from the former product. We employ the term *diversion of sales* to describe the replacement of the sales of a product by sales of the substitute products caused by the increase of the own price of the product.[93]

Below, we make several statements about whether a merger might enable the exercise of market power.[94] These statements refer to the sign (direction) of the effect. To establish harm, it is also necessary to show the likely substantial *magnitude* of the effect. For merger evaluation, it involves

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[86] Competition problems usually arise in concentrated industries. Most of our analysis applies to whether products are homogeneous or differentiated. However, focusing on the latter simplifies the exposition. In most concentrated industries, brands matter.

[87] For consumers that regard tea and coffee as alternatives, an increase in the price of coffee leads them to substitute coffee by tea. Hence, an increase in the price of coffee raises their demand for tea.

[88] For consumers that drink coffee with sugar, an increase in the price of coffee leads them to consume less coffee and thereby less sugar. Hence, an increase in the price of coffee reduces their demand for sugar.

[89] Alternatively, a horizontal merger combines firms that produce substitute products, and a vertical merger combines firms that produce complementary products.

[90] Alternatively, firms are rivals if they operate in the same relevant market.

[91] Alternatively, a wholesaler is a firm that produces a production factor, and a retailer is a firm that uses a wholesale product to produce a final product.

[92] For example, the same brand of soda sold to two distinct supermarket chains are two different wholesale products, and two distinct brands of soda sold by the same supermarket chain are two different retail products.

[93] *E.g.,* the increase in the price of Coca-Cola reduces its demand because some consumers stop purchasing cola beverages altogether, while others switch to alternative cola brands, such as Pepsi-Cola. Consequently, a fraction of the decreased demand for Coca-Cola switches to Pepsi, a substitute product of Coca-Cola.

[94] *Market power* is the ability to raise prices above marginal costs. *Unilateral effects* are the exercise of market power enabled by a merger when firms act independently of their rivals.

considering the facts of the industry, such as the relative size of the firms and diversion ratios, or the use of computational models.

The exercise of market power and the efficiencies induced by a merger may affect prices, quality, and innovation. To simplify the exposition, we focus exclusively on prices.

A. Efficiencies

We begin by discussing the efficiencies enabled by a vertical merger.

In general, a merger may generate efficiencies that reflect into lower marginal costs. In particular, a vertical merger combines complementary assets at different levels. This feature may enable technological and strategic efficiencies. We discuss each of them in turn.

Technological efficiencies refer to technology—or organizational—induced efficiencies. A vertical merger might allow eliminating contractual frictions, improving communication flows, and aligning incentives within the merged firm, which facilitate the rationalization of investments, inventory management, and production. Consequently, marginal costs might fall (*e.g.*, Williamson 1968; Farrell and Shapiro 2000).[95]

Strategic efficiencies refer to efficiencies induced by strategic behavior. Consider the following assumption:

> **(A1)** *Before and after the merger, the wholesaler of the merged firm sells products to the retailer of the merged firm.*

Assumption (A1) is necessary for a vertical merger to enable strategic efficiencies. Before the merger, the wholesaler and the retailer of the merged firm maximize their profits independently. If there is market power upstream and downstream, both firms charge prices above their marginal costs. After the merger, the merged firm maximizes the joint profit of its wholesale and retail units. Given (A1), it can internalize the increase in retail sales caused by a decrease in the wholesale price. Thus, the merged firm sets the wholesale price charged to its retail division at the wholesale marginal cost. It eliminates the wholesale margin. The decrease in the wholesale price—the retail marginal cost—leads the merged firm to reduce the retail price. The elimination of the wholesale margin is usually referred to as the *elimination of double marginalization* (EDM; *e.g.*, Cournot 1838, Spengler 1950).[96]

According to the Horizontal Merger Guidelines, efficiencies should be considered in the merger review if they are: (i) merger specific, (ii) verifiable, and (iii) benefit consumers.[97] The EDM raises several issues regarding whether it is a cognizable efficiency.[98] The first is that assumption (A1)

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[95] Williamson, Oliver E. (1968), "Economies as an Antitrust Defense: The Welfare Tradeoffs," American Economic Review, 58:1, 18-36, https://www.jstor.org/stable/1831653. Farrell, Joseph, and Carl Shapiro (2000), "Scale economies and synergies in horizontal merger analysis," Antitrust Law Journal, 68:3, 685-710.

[96] Cournot, Augustin (1838) "Recherches sur les Principes Mathématiques de la Théorie des Richesses," Paris: L. Hachette. Spengler, J. (1950), "Vertical Integration and Antitrust Policy," Journal of Political Economy, 58:4, 347-352, https://www.jstor.org/stable/1828887

[97] "Cognizable efficiencies are merger-specific efficiencies that have been verified and do not arise from anticompetitive reductions in output or service." United States Department of Justice and The Federal Trade Commission (2010), "Horizontal Merger Guidelines," § 10. Available at (accessed on February 8, 2022): https://www.justice.gov/atr/public/guidelines/hmg-2010.pdf [hereinafter HMGs].

[98] *Supra* note 97.

may not hold in a specific vertical merger. In such a case, the merger may involve no verifiable EDM.

The second is that the EDM may be attainable contractually. For example, if the wholesale supplier and the retail client agree on a two-part tariff as a pricing schedule, where the variable price is set at the wholesale marginal cost, the EDM might be attained without the merger. Thus, the EDM might not be merger specific. However, even if the parties agree on a two-part tariff as a pricing schedule, it is unlikely that the pricing schedule would yield the efficient outcome described above if there are information asymmetries and/or conflicting interests.[99] Hence, even in the presence of such contractual arrangements, there might still be room for *some* EDM.

In any case, whether a merger involves a strategic efficiency through the EDM should be evaluated on case-by-case basis, grounded on the specificities of the industries, transactions, and agents involved, instead of assumed *a priori*.

B. Unilateral Effects

Next, we discuss the unilateral effects;[100] that is, the exercise of market power, enabled by a vertical merger.

B.1. Upstream

Consider the following assumption:

(A2) *The merged firms sell wholesale products to rival retailers.*

Assumption (A2) is necessary for a vertical merger to enable the exercise of market power upstream. Suppose (A2) holds. Let a merged firm raise the wholesale price it charges to a retail rival. If the retail rival rejects the new offer, it will be unable to supply its product if the retail rival has no other potential sources of supply. If the retail rival accepts the new offer, it will have a higher retail marginal cost and, so will set a higher retail price. In either case, the retail rival loses sales. Part of these lost sales will be diverted to the merged firm downstream. Thus, by raising the *wholesale* price it charges to retail rivals, a merged firm can divert sales to its own *retail* products. This feature suggests that a wholesale price increase, which might be unprofitable for an independent wholesaler, may be profitable for the merged firms that maximize the joint profits of the wholesale and retail units, due to the diversion of retail sales. The diversion of retail sales may also allow the merged firm to raise its retail price.

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[99] Regarding how information asymmetry might hinder efficient contracts between wholesalers and retailers, see, *e.g.*, Gal-Or, Esther (1991), "Vertical Restraints with Incomplete Information," Journal of Industrial Economics, Wiley Blackwell, 39:5, 503-516; Charles J. Corbett, Deming Zhou, Christopher S. Tang, (2004), "Designing Supply Contracts: Contract Type and Information Asymmetry," Management Science, 50:4, 550-559, DOI: 10.1287/mnsc.1030.0173; Wang, Jian-Cai, Amy Hing-Ling Lau, and Hon-Shiang Lau (2012), "Practical and effective contracts for the dominant retailer of a newsvendor product with price-sensitive demand," International Journal of Production Economics 138:1, 46-54, DOI: 10.1016/j.ijpe.2011.12.019; and Tamayo, Jorge Andrés, and Guofu Tan (2021), "Competitive Two-Part Tariffs," Harvard Business School, Available at (accessed on April 5, 2022): https://www.hbs.edu/ris/Publication%20Files/21-089_f61b61b6-e589-4e69-a816-2dbec94c4207.pdf

[100] *Supra* note 94.

B.2 Downstream

Consider the following assumption.

(A3) *The merged firms buy wholesale products from wholesale rivals.*

Assumption (A3) is necessary for a vertical merger to enable the exercise of market power downstream. Suppose (A3) holds. Let a merged firm raise the price of a retail product produced with a wholesale product supplied by a wholesale rival. The higher retail price will divert sales to substitute retail products. Increased sales of these alternative retail products imply increased sales for their wholesale suppliers, including the merged firm. Thus, by raising the price of a *retail* product produced with a wholesale product supplied by a wholesale rival, the merged firms can divert sales to their own *wholesale* products. This feature suggests that a retail price increase, which might be unprofitable for an independent retailer, may be profitable for the merged firms that maximize the joint profits of the wholesale and retail units due to the diversion of wholesale sales. The diversion of wholesale sales may also allow the merged firm to raise its wholesale price.

B.3 Foreclosure, Exclusion, and Raising Rivals' Costs

Input foreclosure might be seen as the limiting case of the exercise of upstream market power in Subsection III.B.1, whereby the merged firms set a prohibitive wholesale price.[101] With such a price, *i.e.*, a price that no retail rival is willing to pay, the merged firms make no sales of the wholesale product. Similarly, customer foreclosure is the limiting case of the exercise of downstream market power in Subsection III.B.2, where the merged firms set a prohibitive retail price. With such a price, the merged firms make no retail sales and, therefore, no purchases of the associated wholesale product.

Neither the exercise of market power upstream nor downstream are raising rivals' costs (RRC) strategies, in that they do not meet the RRC definition: *costly* activities that raise rivals' costs.[102]

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[101] *Input foreclosure* refers to the situation where the merged firm refuses to sell a wholesale product to a retail rival. *Consumer foreclosure* refers to the situation where the merged firm refuses to acquire a wholesale product from a wholesale rival. Formally, a *prohibitive price* is an infinity price, although a price set at a finite but high level would have the same effect.

[102] In the opening paragraphs, David Scheffman and Richard S. Higgins state:

> "The theory of "raising rivals' costs" (RRC) deals with actions that might be taken by a firm with market power ("dominant firm") to harm its rivals even if those actions **may also harm the dominant firm**. The sorts of actions dealt with in the theory are ones that, in various way, **raise the costs of rivals and of the dominant firm**. Originally, a focus of the theory was a type of "vertical squeeze" theory, that is, theories in which the dominant firm and its rivals purchased an input, and the dominant firm "overpurchased" that input in order to raise the price of the input to its rivals (Scheffman and Higgins 2003). **By doing so, however, the dominant firm also raised its own costs** by purchasing at higher prices than without the "overpurchasing."
> "The fundamental insight of the theory is that increases in rivals' *marginal* costs will lead the rivals to reduce their output relative to an initial equilibrium level. Other things equal, that will cause their prices to rise, which, alone, is a benefit to the dominant firm. **However, recall that in this theory, the dominant firm also experiences an increase in its marginal costs, which other things equal, reduces its profits.** The net effect on the dominant firm's profits is the combination of lower output/higher prices of rivals and the higher input costs of the dominant firm." (Emphasis in original; bold added.) David Scheffman and Richard S. Higgins (2014), "Raising Rivals' Costs," Oxford Handbook on International Antitrust Economics, Vol. 2, Edited by Roger D. Blair and D. Daniel Sokol, Oxford University Press. DOI: 10.1093/oxfordhb/9780199388592.013.0003, p. 62.

The exercise of market power upstream raises the marginal costs of retail rivals, but not those of the merged firm. The exercise of market power downstream does not raise the marginal costs of either the wholesale rivals or the merged firm.

Neither the exercise of market power upstream nor downstream have an obvious exclusionary intent. They aim at diverting sales from the rivals' products to the merged firms' products, down-stream or upstream. This feature reduces the rivals' profits and may cause them to exit. However, the exercise of market power does not require a rival's exit to be profitable.

Finally, neither the exercise of market power upstream nor downstream have a predatory nature. They do not involve a short-run profit sacrifice for the pursuit of a long-run profit gain. Although they might be unprofitable for independent firms, they are both profitable for a merged firm, even if rivals do not exit.

IV. Theoretical Framework

The purpose of this section is to present the basic elements of the analysis in the simplest possible setting. These principles provide some intuition about the forces at play. The technical details that arise can be skipped without loss of continuity. Additional technical details are in the Appendix.

Consider an industry with two types of firms: wholesalers and retailers. We assume that retail (wholesale) products are gross substitutes. This assumption means that the retailers (wholesalers) compete with each other. Producing a wholesale product involves a specific marginal cost. Without loss of generality, the only marginal cost associated with the production of a retail product is the price of the associated wholesale product.

Next, we present three stylized models. The first discusses the effect of the EDM. The second discusses the effect of the exercise of market power. The third combines the previous two.

A. Efficiencies and exit

We begin discussing a model where a vertical merger allows the EDM but enables no exercise of market power. That is, assumption (A1) holds, but assumptions (A2) and (A3) do not. This model is useful for evaluating the impact of the EDM on the rivals' profits and social welfare.

Initially, there are two wholesalers: wholesaler 1, U_1, and wholesaler 2, U_2; and two retailers: retailer 1, R_1, and retailer 2, R_2. Each wholesaler produces only one product, which it sells only to one of the retailers. Each retailer buys only one wholesale product that it uses to produce one retail product. Wholesaler U_1 produces wholesale product 1, sells it to R_1, with which the latter
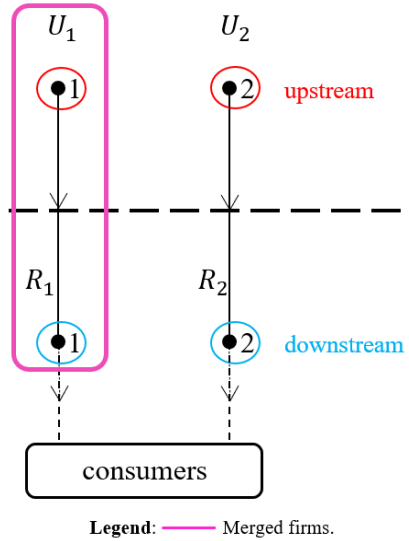
In footnote 1, they add:
> "The original unique contribution of the original RRC papers was that they showed that it could pay for the dominant firm to take actions that raised the costs of its rivals, *even though as a consequence, the dominant firm raised its own costs.*" (Emphasis in original.) *Id.*at 62*.*

For details, see Salop and Scheffman (1983), *supra* note 19; Scheffman and Higgins (2014), *supra* note 102; and the references therein.

produces retail product 1. Similarly, for U_2 and R_2. Denote the merged firm by VM. Figure 1 depicts the situation.
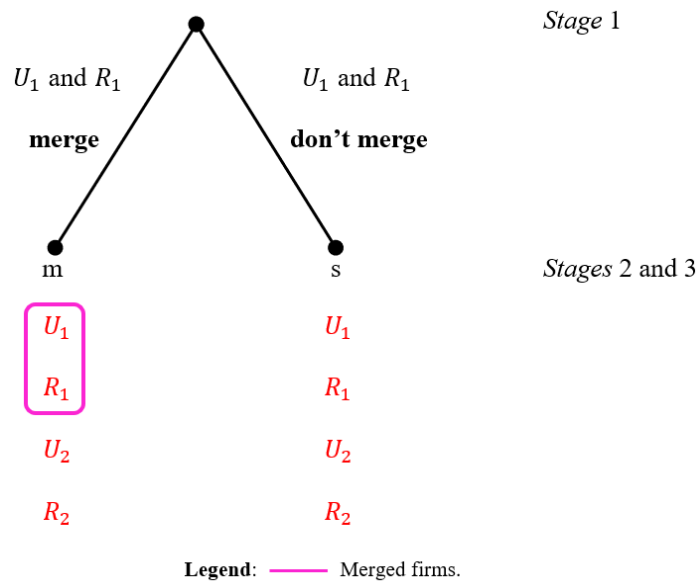
Figure 1

Legend: ——— Merged firms.

Notes. Schematic representation of the model in Subsection IV.A.

Events unfold in three stages. In stage 1, U_1 and R_1 decide whether to merge. In stage 2, wholesalers choose their prices. Finally, in stage 3, retailers choose their prices. At the end of each of these stages, all firms observe the actions taken. Figure 2 shows the timing of the game.

Figure 2

Legend: ——— Merged firms.

Notes. Timing of the game in Subsection IV.A.

Stage 1 has two outcomes, either U_1 and R_1 merge or not. Following these outcomes, respectively, either: (i) *VM* competes upstream with U_2 and downstream with R_2, or (ii) upstream R_1 and R_2 compete, and downstream U_1 and U_2 compete.
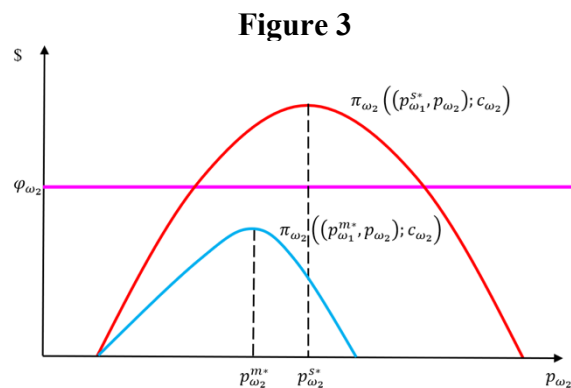
The equilibrium retail prices are increasing functions of the wholesale prices, the retail marginal costs.

For *VM*, the sales of the wholesale product by the wholesale unit cancel out with the purchases of the wholesale product by the retail unit. Hence, *VM* takes the wholesale marginal cost as its opportunity cost.[103] This is equivalent to setting the wholesale price at the wholesale marginal cost. Hence, if U_1 and R_1 merge, *VM* sets wholesale price 1 at the wholesale marginal cost. Otherwise, the wholesalers set wholesale prices above marginal cost.

If U_1 and R_1 merge, *VM* lowers wholesale price 1 to the wholesale marginal cost. Wholesaler U_2 responds by also reducing wholesale price 2. In turn, the decrease in the wholesale prices translates into a reduction in retail prices. The merged firm, *VM*, lowers retail price 1. Retailer R_2 responds by reducing retail price 2. Thus, if the merger takes place, wholesale and retail prices decrease due to the EDM. Social welfare increases. Given assumption (A1), if U_1 and R_1 merge, their maximum joint profit is larger than the sum of their maximum individual profits.

Next, we examine how a merger where the EDM is present, affects the profits of the merged firm's rivals and how their eventual exit from the industry impacts social welfare. A firm exits if it has negative profits; that is, if its revenues minus variable costs do not cover the fixed costs. Given the exclusive relationship between wholesalers and retailers, either both U_2 and R_2 exit or neither exits.

As discussed, *supra*, the EDM causes a decrease in wholesale price 1 and a smaller decrease in wholesale price 2, which induces a decrease in retail price 1 and a smaller decrease in retail price 2. These relative price variations divert demand from retail product 2 to retail product 1.[104] In addition, the decrease in wholesale price 2 reduces the profit margin of U_2. The profit of wholesale rival U_2, decreases. Consequently, U_2 might no longer be able to cover its fixed costs and might exit the industry. Similarly, for R_2. Figure 3 depicts the situation.

Figure 3

Notes. Wholesaler U_2's profits before and after the merger. c_{ω_2} is the marginal cost, φ_{ω_2} is the fixed cost, p_{ω_2} is the price, $p_{\omega_2}^{m*}$ is the equilibrium price after the merger, $p_{\omega_2}^{s*}$ is the equilibrium price before the merger, and $\pi_{\omega_2}(\cdot)$ is the profit of U_2. $p_{\omega_1}^{m*}$ is the equilibrium price of *VM*. $p_{\omega_2}^{s*}$ is the equilibrium price (before the merger) of U_1.

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103 *Opportunity cost* of a resource is the value of the best-forgone alternative for that resource.
104 See Fernando Luco and Guillermo Marshall (2020), "The Competitive Impact of Vertical Integration by Multi-product Firms," American Economic Review, 110:7, 2041-64, DOI: 10.1257/aer.20180071.

Due to the EDM, if there is a merger, the exit of U_2 and R_2 becomes more likely. In other words, a merger *might* cause an exit.

If exit occurs, product variety is reduced. The decrease in product variety might have significant welfare consequences for consumers.[105] In addition, the price of retail product 1 may be higher or lower than if there is no merger. On the one hand, the merged firm, *VM*, has a lower retail marginal cost than the independent duopolist, R_1. On the other hand, *VM* is a monopolist and so faces a demand that is less sensitive to price. Hence, if it causes U_2 and R_2 to exit, the merger between U_1 and R_1 has a potentially ambiguous impact on social welfare. In any case, market concentration increases, both upstream and downstream.

If, in addition to the strategic efficiencies underlying the EDM, a vertical merger also generates technological efficiencies, *i.e.*, reduces the merged firm's marginal cost, then the decrease of wholesale price 1 and retail price 1 and, thereby, of the profits of U_2 and R_2, is even larger. This effect increases the likelihood that U_2 and R_2 might exit after the U_1-R_1 vertical merger.

In summary, on the one hand, due to the EDM, a vertical merger causes price reductions, which increase social welfare. If there is no exit, the EDM generated by a vertical merger has a positive impact on social welfare. On the other hand, also due to the EDM, a vertical merger might lead to rivals' exit, even in the absence of *any* exclusionary behavior. If exit does occur, the overall impact of a vertical merger on social welfare is potentially ambiguous due to the resulting horizontal harm caused by rivals' exit.[106] Hence, the EDM, one of the redeeming aspects of a vertical merger, may have anticompetitive consequences. The impact of the EDM should be fully analyzed by incorporating the possibility of exit and its consequences.

The welfare effects could also depend, in part, on whether the rival who does not find it profitable to operate in the short run would return to the market or it is replaced by another entrant if the merged firms increase their retail price. Timely and sufficient re-entry that is likely to occur could mitigate or reverse the harmful effects of exit on welfare. Hence, the negative impact of exit is likely to be more pronounced in industries where barriers to entry are present. However, the industries where mergers raise competition concerns are typically concentrated. High concentration levels might reveal some form of entry barriers. The possibility of re-entry might be of little avail in those cases.[107]

Discussion

While efficiencies may also induce rivals' exit in horizontal mergers,[108] there are aggravated concerns for vertical mergers for two reasons. The first is that a horizontal merger necessarily involves unilateral effects.[109] Hence, for a horizontal merger, the underlying reduction in marginal

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[105] See, *e.g.*, Donna *et al.* (2021), *supra* note 16.

[106] The EDM leads the merged firm to reduce the wholesale and retail prices. Rivals respond by also decreasing their retail prices. Social welfare increases. However, if exit occurs, social welfare is impacted negatively by two effects. First, product variety decreases. Second, the firms that remain in the industry might increase their prices (above the pre-merger levels) because exit might reduce the competitive pressure of active rivals.

[107] See example C in Section II, *supra*, for a case illustration.

[108] *E.g.*, technological efficiencies. *Supra* note 95. If these marginal cost reductions decrease the merged firm price, they will divert sales *from* the rivals and lower their profits. If the diversions are large enough, they might cause rivals to exit the industry.

[109] The internalization of the sales' diversion puts upward pressure on prices.
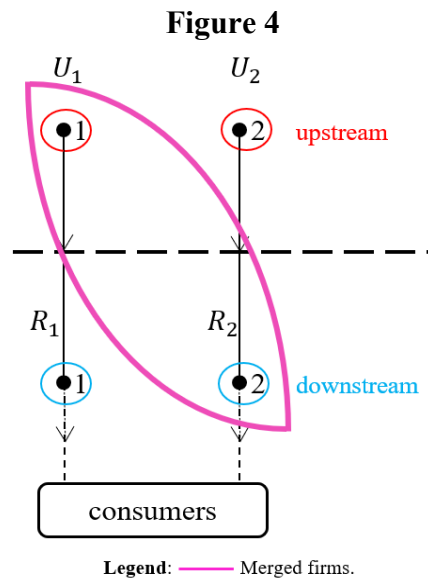
costs due to technological efficiencies may not lead to price reductions or an increase in welfare.[110] Even if the efficiencies lead the merged firm to reduce prices, the magnitude of the reduction may not be enough to induce rivals' exit. A vertical merger may involve no unilateral effects. Under these circumstances, if any marginal cost efficiencies occur, they may be fully reflected in price decreases of the merged firm.

The second is that a vertical merger might involve strategic efficiencies (EDM) in addition to the technological efficiencies.[111] The strategic-efficiency effects compound those of the latter. Hence, in principle, a vertical merger may generate larger "marginal cost" reductions than those generated by a horizontal merger.

B. Unilateral effects and exit

Next, we discuss a model where a vertical merger enables the exercise of market power but involves no EDM. That is, assumptions (A2) and (A3) hold, but assumption (A1) does not. This model is helpful for two reasons. First, to describe how a vertical merger enables the exercise of market power, both upstream and downstream. Second, to evaluate how a vertical merger impacts the rivals' profits and social welfare.

Consider the same model setup as in the previous subsection, except that now the events unfold as follows. There are three stages. In stage 1, U_1 and R_2 decide whether to merge.[112] In stage 2, wholesalers choose their prices. Finally, in stage 3, retailers choose their prices.[113] Figure 4 depicts the situation.

Figure 4

Legend: —— Merged firms.
Notes. Schematic representation of the model in Subsection IV.B.

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[110] This result is well-known and widely recognized. See, *e.g.*, HMGs, *supra* note 97.

[111] *Supra* notes 96 and 106.

[112] Recall that each wholesaler produces only one product, which it sells only to one of the retailers. In particular, manufacturer U_1 does not sell the product to retailer R_2.

[113] As before, all firms observe the actions taken at the end of each of these stages. We maintain these specifications henceforth.

As in the previous subsection, stage 1 has two outcomes. Following these outcomes, respectively, either: (i) *VM* competes upstream with U_2 and downstream with R_1, or (ii) downstream U_1 and U_2 compete and upstream R_1 and R_2 compete.

For an independent retailer, the equilibrium condition for its retail price balances two effects.[114] First, the *margin effect*. Given the quantity sold of the product, an increase in the retail price raises the margin at which each unit of product is sold. This effect increases profit. Second, the *volume-of-sales effect*. An increase in the retail price decreases the quantity demanded of the product. This effect reduces profit.

For the merged firm, *VM*, the equilibrium condition for its retail price includes an additional effect. *VM* owns wholesale product 1 and retail product 2. Consequently, for the *VM*, the equilibrium condition for retail price 2 includes the margin effect, the volume-of-sales effect, and in addition the *retail-wholesale-diversion effect*, whereby an increase in retail price 2 diverts demand from retail product 2 to retail product 1. Larger sales of retail product 1 imply more sales of wholesale product 1. This effect increases the sales and profits of wholesale product 1.

For an independent wholesaler, the equilibrium condition for its wholesale price also balances the margin and the volume-of-sales effects.

For *VM*, the equilibrium condition for its wholesale price, wholesale price 1, involves the margin effect, the volume-of-sales effect, and two additional effects. The third effect is the *wholesale-retail-diversion effect*.[115] An increase in wholesale price 1, the marginal cost of retail product 1, raises retail price 1. This effect diverts sales from to retail product 1 to retail product 2, which increases the sales and profits of retail product 2. The fourth effect is the *pass-through effect*. Given the quantity sold of retail product 2 (and that retail prices are increasing in wholesale prices), an increase in wholesale price 1 raises retail price 2. This effect increases the margin of each unit and, therefore, the profit of retail product 2.

If U_1 and R_2 merge, due to the retail-wholesale-diversion effect, *VM* rises retail price 2. Retailer R_1 responds by also increasing its retail price 1. In addition, due to the wholesale-retail-diversion and the pass-through effects, *VM* raises wholesale price 1. Wholesaler U_2 may respond by increasing or decreasing wholesale price 2.[116] Thus, due to the exercise of market power, if there is a merger, retail prices increase. Social welfare decreases.

The increased retail prices reduce the equilibrium consumption of both products. The increase in wholesale price 1 reduces the margin of retailer R_1. Hence, the profit of retail rival R_1 decreases. Wholesale price 2 and, thereby, the margin of U_2, may decrease or increase. In either case, the profit of wholesale rival U_2 decreases.

To sum up, the exercise of market power (upstream and downstream) raises retail prices, thereby decreasing social welfare. Furthermore, the exercise of market power (upstream and downstream) reduces the profits of the merged firm's rivals (upstream and downstream).[117]

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[114] These effects are also present in the model in the previous subsection, although they are irrelevant to the discussion of the impact of the EDM. The merger under analysis causes various direct and indirect effects on wholesale and retail prices. We focus on the former.

[115] The retail-wholesale-diversion and wholesale-retail-diversion effects operate in opposite directions.

[116] The wholesale products may be gross substitutes without a merger and become gross complements with a merger.

[117] Of course, the exit of U_2 implies the exit of the retailer of the merged firm, and the exit of R_1 implies the exit of the wholesaler of the merged firm. This brings into question the profitability of the exercise of market power enabled

Discussion

There are similarities and differences between the exercise of market power enabled by horizontal and vertical mergers. If a firm (wholesaler or retailer) produces (owns) two substitute products, obtained possibly through a merger, an increase in the price of one of those products diverts sales to the other product, thereby raising its profit. Because the firm owns both products, this profit increase is appropriated, or *internalized*, by the firm, which encourages the firm to set a higher price. This diversion effect is the process through which a horizontal merger enables the exercise of market power.[118]

The retail-wholesale-diversion effect is the process through which a vertical merger enables the exercise of market power downstream. The wholesale-retail-diversion effect and the pass-through effect are the processes through which a vertical merger enables the exercise of market power upstream.

Hence, a horizontal merger increases the market power of the merged firm by allowing the internalization of the diversion of sales between firms that produce substitute products.

Similarly, if (A2) (respectively, A3) hold, a vertical merger increases the market power of the merged firm upstream (downstream) by allowing the internalization of the diversion of sales between firms that produce complementary products. However, the way the diversion of sales works in horizontal and vertical mergers and, more importantly, its impact on rivals is fundamentally different.

In a horizontal merger, the increase in the merged firms' prices causes a diversion of sales *between* the products owned by the merged firm. Rivals benefit from this exercise of market power, as the underlying diversion of sales spills over *to* their products. Thus, in a horizontal merger, the diversion of sales shifts business *to* the rivals of the merged firm, which increases their profits.

In a vertical merger, the increase in the merged firm's prices upstream (downstream) causes a diversion of sales *from* the rivals' products *to* the merged firm's products downstream (upstream). Thus, in a vertical merger, the diversion of sales shifts business *from* the rivals of the merged firm, which decreases their profits.

The Agencies reviewing vertical mergers frequently focus on theories of harm based on input foreclosure, consumer foreclosure, and exclusionary theories. There are instances where such strategies might not be profitable for the merged firm. Furthermore, while sufficient, they are not necessary to establish harm to social welfare in a vertical merger, as we have shown, *supra*. Conditions (A2) and (A3) allow the merged firm to exercise market power in a potentially harmful way to both rivals and consumers without any form of exclusion.

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by the merger under analysis if it were to cause the exit of rivals. This issue only occurs because the model is very parsimonious. In a model with more products and firms, the exit of rivals need not imply the exit of components of the merged firm. Hence, the profit-maximizing exercise of market power, enabled by a vertical merger, may cause rivals to exit.
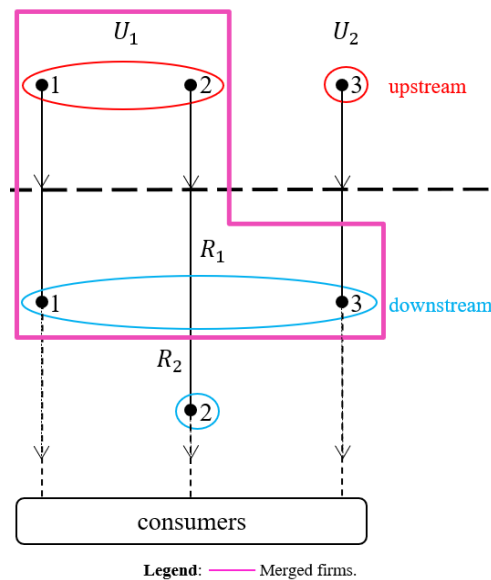
[118] See Luco and Marshall (2020), *supra* note 104.

C. Putting Everything Together

Finally, we discuss a model where a vertical merger enables both the EDM and the exercise of market power. That is, assumptions (A1), (A2), and (A3) all hold.

Consider the same model setup as in Subsection IV.A, except the following. There are three wholesale products: wholesale product 1, u_1, wholesale product 2, u_2, and wholesale product 3, u_3; and there are three retail products: retail product 1, r_1, retail product 2, r_2 and retail product 3, r_3. Wholesale product u_1 is used to produce retail product r_1, u_2 is used to produce r_2, and u_3 is used to produce r_3. Initially, there are two wholesalers, U_1 and U_2, and two retailers R_1 and R_2. Wholesaler U_1 produces u_1 and u_2, and wholesaler U_2 produces u_3. Retailer R_1 produces r_1 and r_3, and retailer R_2 produces r_2. Figure 5 shows the schematic representation.

Figure 5

Notes. Schematic representation of the model in Subsection IV.C.

Events unfold in three stages. In stage 1, U_1 and R_1 decide if they merge or not. In stage 2, wholesalers choose their prices. Finally, in stage 3, retailers choose their prices.

Applying the reasoning developed in the previous subsections, a vertical merger between U_1 and R_1 leads to a decrease in wholesale price 1 (caused by the EDM), and an increase in wholesale price 2 (caused by the exercise of market power upstream). In addition, it leads to a decrease in retail price 1 (caused by the EDM), and an increase in retail price 3 (caused by the exercise of market power downstream). Determining the sign of the variation of wholesale price 3 and retail price 2 requires additional assumptions.

Because the merger causes these upward and downward price variations, it has a potentially ambiguous impact on social welfare. These price variations are associated with a decrease in the wholesale rival U_2 and retail rival R_2 profits, possibly causing them to exit the industry. If exit occurs, the evaluation of the impact of the merger on social welfare becomes more difficult.

Discussion

The previous analysis suggests three conclusions. First, a vertical merger may cause a complex pattern of price variations, in line with those documented by Luco and Marshall (2020),[119] with some prices decreasing, pushed by the EDM, and other prices increasing, pulled by the exercise of market power.

Second, the price variations caused by a vertical merger may decrease the profits of some of the merged firm's wholesale and retail rivals, possibly causing them to exit the industry.

Third, the complexities of vertical mergers burden the evaluation of their impact on social welfare. However, by using their legal powers to obtain information and properly adjusted standard methods of analysis, Agencies can predict exit and evaluate its impact on social welfare. These methods of analysis cover a wide range of approaches. At one extreme are soft quantitative methods. They involve using qualitative information or simple data. With information about margins, fixed costs, and expected sale losses, it is possible to identify firms at risk of exiting. With data on market shares and diversion ratios, it is possible to obtain rough estimates of the associated price and welfare variations. At the other extreme are hard quantitative methods. They involve estimating and simulating economic equilibrium models. These methods enable estimating equilibrium prices, profits, and consumer surplus variations, with and without exit.[120] With this information, it is possible to credibly identify firms at risk of exiting and the associated welfare variations.

For example, a scenario raising a potentially serious concern is when the vertical merger might induce the exit of a large rival in terms of market shares. Such a scenario might occur when the rival has high fixed costs and high variable profits; our discussion in Section II, *supra*, provides some examples. A small demand diversion might induce the rival out of business in such a scenario. True, observing costs might be challenging for the Agencies; but cost observability is not necessary to perform the evaluation. The Agencies can use an estimate of the rivals' profits and the diversion ratios resulting from the vertical merger. The Agencies might obtain information about rivals' profits using their subpoena power; they could obtain information about the diversion ratios using quantitative methods.[121]

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[119] *Supra* note 104.

[120] The field of Industrial Organization has made substantial progress in the past decades regarding the development of these methods to quantify, *ex ante*, the likely impact of a merger on prices and social welfare. See, *e.g.*, Nevo, Aviv, "Mergers with differentiated products: The case of the ready-to-eat cereal industry," RAND Journal of Economics, 31:3, 395-421, DOI: 10.2307/2600994; Berto Villas-Boas, Sofia (2007), "Vertical relationships between manufacturers and retailers: Inference with limited data," Review of Economic Studies 74: 2, 625-652, DOI: 10.1111/j.1467-937X.2007.00433.x; Bonnet, Céline, and Pierre Dubois (2010), "Inference on vertical contracts between manufacturers and retailers allowing for nonlinear pricing and resale price maintenance," RAND Journal of Economics 41:1, 139-164, DOI: 10.1111/j.1756-2171.2009.00093.x; Crawford, Gregory S., Robin S. Lee, Michael D. Whinston, and Ali Yurukoglu (2018), "The welfare effects of vertical integration in multichannel television markets," Econometrica 86:3, 891-954, DOI: 10.3982/ECTA14031; Pereira, Pedro and Tiago Ribeiro (2018), "Evaluating Partial Divestitures When Vertical Relations are Important," Review of Industrial Organization 53:2, 321-345, DOI: 10.1007/s11151-018-9619-y; Donna *et al.* (2021), *supra* note 16; and Donna *et al.* (2022a), *supra* note 51.

[121] For example, one might adapt the methods used to evaluate horizontal and vertical mergers referenced in footnote 120, *supra*.

V. Concluding remarks

Vertical and horizontal mergers are fundamentally different.

A horizontal merger increases market power by allowing the internalization of the diversion of sales between firms that produce *substitute* products. A vertical merger increases market power by allowing the internalization of the diversion of sales between firms that produce *complementary* products. In both cases, higher prices reduce consumer welfare. However, while a horizontal merger diverts sales *to* rivals, thereby increasing their profits, a vertical merger diverts sales *from* rivals, decreasing their profits.

Both horizontal and vertical mergers might enable marginal cost efficiencies that lower the merged firm's price, thereby diverting sales *from* rivals and reducing their profits. This issue is potentially more severe for vertical mergers because they need not involve unilateral effects and have more scope for efficiencies due to the elimination of double marginalization.

The profit reductions might cause the rivals to exit the industry, even without *any* exclusionary intent. Rivals' exit can fundamentally change the evaluation of a vertical merger. Rivals' exit might reduce product variety and the competitive pressures that active rivals impose on dominant suppliers, thus reducing welfare. Moreover, some of the forces that enhance welfare in the absence of exit (reduction in prices charged by non-integrated retail rivals), do not longer enhance welfare when an exit is present. Exit might transform a welfare-enhancing vertical merger into a harmful one. Rivals' exit should, therefore, be an integral part of the analysis of vertical mergers.

The theoretical framework that we developed in this Article complements the existing theories of harm of vertical mergers. In our theory, harm occurs due to the exercise of market power enabled by the merger, regardless of whether an exit occurs. The exercise of market power reduces rivals' profits, hindering their ability to compete and might drive rivals out of the market. Rivals' exit further harms social welfare due to the reduction in the array of differentiated products available to consumers and the reduction in the number of competitors that would otherwise exert downward pricing pressure. Similarly, vertical-merger enabled efficiencies might induce rivals' exit. Therefore, rivals' exit might be a natural, perhaps unintended, consequence of a vertical merger.

Our theory shows that harm might occur without exit and that rivals might exit even in the *absence* of foreclosure, exclusion, and raise in rivals' costs (RRC). However, the presence of such vertical practices—foreclosure, exclusion, and RRC—exacerbates the possibility of rivals' exit. Social welfare may be further harmed in such cases. The examples discussed show how our theory of vertical mergers and the mentioned vertical practices could result in a violation of Section 7 of the Clayton Act.[122]

We conclude with two final points.

The first relates to complementary-product mergers. While our analysis focuses on vertical mergers, the same economic principles apply, with the mentioned due differences, in mergers of firms that produce complementary products, as discussed in examples E and F of Section II, *supra*.

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[122] 15 U.S.C. § 18.

The second point relates to the Schumpeterian idea of efficient production reallocation.[123] The exit of inefficient firms may be socially desirable under certain conditions.[124] Three observations warrant emphasis in this regard. First, from an antitrust perspective, the matter is not whether a vertical merger may induce a more efficient industry reconfiguration. Instead, the issue is that the exercise of market power and the efficiencies enabled by a vertical merger might: (i) reduce social and consumer welfare directly and (ii) reduce rivals' profits, possibly causing them to exit the industry. Rivals' exit in such cases may substantially lessen competition using horizontal merger standards.[125] Second, whether a vertical merger induces a more efficient configuration of the industry should not be taken for granted. It might. But it is an issue that must be proved rather than assumed. To evaluate such a theory, one needs to measure the efficiency gains or justify why they may arise. Third, such efficiency gains have a dynamic component likely to materialize in the *long run*. The argument in this Article posits that certain exit-inducing vertical mergers may harm social welfare with a high probability in the short and medium run.[126] A caveat for a long-run evaluation is that the longer the time horizon, the more uncertain and difficult it is to perform the evaluation credibly. In addition, we showed that the efficiencies enabled by the vertical merger might exacerbate, rather than mitigate, the welfare problem.

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[123] Joseph A. Schumpeter (1962) [1942], "Capitalism, Socialism, and Democracy," Harper Torchbooks; Third Edition, ASIN B000ND9Z3M.

[124] In the Schumpeterian theory of growth and creative destruction, firms innovate to gain temporary market power while in the process destroy the existing inferior technologies.

[125] Alternatively, the Schumpeterian argument can be used to defend a horizontal merger that grants a temporary monopoly (or greater market power) to the most efficient firm (technologies). Schumpeter (1942), *supra* note 123.

[126] The time horizon considered by the Agencies, *e.g.*, a five-year period.

Appendix

A. Preliminaries

Next, we provide some details about the analysis in Sections III and IV, *supra*. For a more general model and its estimation, see Donna *et al.* (2022b).[127]

Consider the following assumption:

(A4) *(a) Each retail product has a downward sloping demand curve. (b) The demands of retail products are such that retail products are strategic complements. (c) Each wholesale product has a downward sloping demand curve. (d) The demands of wholesale products are such that wholesale products are strategic complements.*

Assumption (A4) (a) and (c) means that retail and wholesale firms have market power, which is a natural occurrence in concentrated markets.

Regarding Assumption (A4) (b), in Sections III and IV, *supra*, we assumed that retail products are gross substitutes. More generally, we assume that retail products are strategic complements. This assumption ensures that the retail pricing game is supermodular. For linear demands, retail products being gross substitutes is equivalent to retail prices being strategic complements. More generally, strategic complementarity follows if the demands are log-concave; that is, each firm's own-price elasticity of demand decreases with its competitors' prices. Similarly, for wholesale products, *i.e.*, (A4) (d). For the concept of strategic substitutes and strategic complements see, *e.g.*, Bulow *et al.* (1985).[128] For the concept of a supermodular game see, *e.g.*, Topkis (1998).[129]

B. Efficiencies and Exit

Wholesalers and retailers are indexed with subscript $\tau = \omega, r$, respectively. For j=1,2, wholesaler j produces wholesale product j, and retailer j produces retail product j. Let U_j sell its product to $R_j, j = 1, 2$. The results in Section IV, *supra*, can be generalized to the case of $N^\omega > 1$ upstream multiproduct oligopolists, and $N^r > 1$ downstream multiproduct oligopolists. At the end of each of the game stages, all firms observe all preceding actions. The equilibrium concept is subgame perfection. Denote whether the merger occurred or not by superscript $\gamma = m, s$, respectively.

For j=1,2 and $\tau = \omega, r$, let p_{τ_j} be the price of a type τ product j, c_{ω_j} be the marginal cost of wholesale product j, φ_{τ_j} be the fixed cost of a type τ product j, and D_j be the demand of product j. The profit of U_j is, for j=1, 2:

$$\pi_{\omega_j} := \left(p_{\omega_j} - c_{\omega_j} \right) D_j - \varphi_{\omega_j}. \tag{1}$$

The profit of R_j is:

$$\pi_{r_j} := \left(p_{r_j} - p_{\omega_j} \right) D_j - \varphi_{r_j}. \tag{2}$$

[127] Donna, Javier D., Pedro Pereira, and Yun Pu (2022b), "Inducing-Exit Vertical Mergers," Working Paper.
[128] Bulow, Jeremy I., John D. Geanakoplos, and Paul D. Klemperer (1985), "Multimarket oligopoly: Strategic substitutes and complements," Journal of Political Economy 93: 3, 488-511, DOI: 10.1086/261312.
[129] Donald M. Topkis (1998), "Supermodularity and Complementarity," Princeton University Press.

Allowing for retail product j to have a positive marginal cost, in addition to p_{ω_j}, does not change the analysis.[130]

The profit of the *VM* is:

$$\pi_m := \pi_{r_1} + \pi_{\omega_1} = (p_{r_1} - c_{\omega_1})D_1 - \varphi_{\omega_1} - \varphi_{r_1}. \tag{3}$$

Denote the equilibrium wholesale prices by $(p_{\omega_1}^*, p_{\omega_2}^*)$, and the equilibrium retail prices by $(p_{r_1}^*(p_{\omega_1}, p_{\omega_2}), p_{r_2}^*(p_{\omega_1}, p_{\omega_2}))$. It follows from (A4) (b) that the equilibrium retail prices, $p_{r_j}^*(\cdot)$, are increasing functions of the wholesale prices, p_{ω_j}, the retail marginal costs.

Inspection of (3) shows that *VM* takes c_{ω_1} as its opportunity cost. This is equivalent to setting $p_{\omega_1}^* = c_{\omega_1}$. Otherwise, the wholesaler sets $p_{\omega_j}^* > c_{\omega_j}, j=1,2$.

If U_1 and R_1 merge, *VM* reduces its wholesale price to marginal cost, $c_{\omega_1} = p_{\omega_1}^{m*} < p_{\omega_1}^{s*}$, and, consequently, reduces also its retail price, $p_{r_1}^{m*} < p_{r_1}^{s*}$. U_2 responds by reducing its price, $p_{\omega_2}^{m*} < p_{\omega_2}^{s*}$, due to (A4) (d), and R_2 responds by reducing its price, $p_{r_2}^{m*} < p_{r_2}^{s*}$, due to (A4) (b).

To simplify the exposition, we did not consider the possibility of exit in the specification of the game. It would require adding a stage, between current Stage 1 and Stage 2, where U_2 and R_2 decide whether to exit.

The price variations that follow a merger between U_1 and R_1, also reduce the profit of R_2. The complexity of the process is increased because of the decrease in $p_{\omega_2}^*$. Still, under standard conditions, the merger does reduce the profit of R_2.

C. Unilateral Effects and Exit

Consider the following assumption:

(A4) *(e) Wholesale products are gross complements.*

Assumption (A4) (d) is more stringent than (A4) (b). While it is reasonable to expect that, in most economically relevant cases, (A4) (b) holds without and with a merger, (A4) (d) may hold without a merger but be reversed by a merger. It is easy to construct non-pathological examples where this happens. Assumption (A4) (e) accommodates this possibility. This problem does not occur in the model in Subsection IV.A, *supra*, but it might arise in the models in Subsections IV.B and IV.C, *supra*.

The profits of an independent wholesaler and retailer are given by equations (1) and (2), respectively. The profit of the merged firm, *VM*, is now:

$$\pi_m := \pi_{r_2} + \pi_{\omega_1} = (p_{r_2} - p_{\omega_2})D_1 + (p_{\omega_1} - c_{\omega_1})D_1 - \varphi_{\omega_1} - \varphi_{r_1}.$$

If U_1 and R_2 merge, *VM* increases its retail price due to the retail-wholesale-diversion effect: $p_{r_2}^{s*} < p_{r_2}^{m*}$. R_1 responds by also raising its price due to (A4) (b): $p_{r_1}^{s*} < p_{r_1}^{m*}$. In addition, due to the wholesale-retail-diversion and the pass-through effects, *VM* increases its wholesale price: $p_{\omega_1}^{s*} < p_{\omega_1}^{m*}$. U_2 may respond by increasing (alternatively, decreasing) $p_{\omega_2}^*$ if assumption (A4) (d) (respectively, assumption A4 e) holds.

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[130] For a more general specification, see Donna *et al.* (2022a), *supra* note 51, § 3.2.