ANALYSIS OF THE DOWNSTREAM-COLLUSIVE EFFECT IN VERTICAL MERGERS

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Abstract

The downstream-collusion effect is one of the possible impacts on competition after a vertical merger. However, little legal and economic literature has discussed this topic thoroughly. Therefore, this Article first delves into analyzing the harm of the downstream-collusive effect. By using game-theoretic models, we find that the scale of the saved unit cost or downstream cost and the level of heterogeneity between the downstream firms' final goods could affect the incentives of downstream-collusive behavior. Next, we integrate the concepts derived from the models into the Vertical Merger Guidelines and the burden-shifting framework. This economic concept should aid antitrust agencies in assessing the viability of bringing vertical merger challenges with some proof of downstream-collusive behavior. Finally, we address our critiques of the AT&T–Time Warner merger case and take it as an example to demonstrate how to apply the updated burden-shifting framework to a real-world merger case. This should aid federal courts in understanding how to analyze the downstream-collusive effect in future vertical merger cases.

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INTRODUCTION

Vertical merger analysis has been ignored for a long time because of the acceptance of the single-monopoly-profit theory in both the academic world [1] and the U.S. Supreme Court. [2] This theory assumes that a monopolist in one product market cannot increase its profits by using bundling to leverage itself into a second monopoly in another product market.[3] After this theory was developed, Professor Bork took it as one of the main justifications that the vertical merger should be treated as presumptively lawful and procompetitive under section 7 of the Clayton Act.[4] Moreover, Professor Bork argued that vertical mergers are highly efficient because of the effect of elimination of double marginalization (EDM)—the cost reduction between the upstream and downstream

1. *See* ROBERT BORK, THE ANTITRUST PARADOX 372–75, 380–81 (1978); RICHARD A. POSNER & FRANK H. EASTERBROOK, ANTITRUST 802–03 (2d ed. 1981); RICHARD POSNER, ANTITRUST LAW: AN ECONOMIC PERSPECTIVE 198–99 (2d ed. 2001); Ward S. Bowman, Jr., *Tying Arrangements and the Leverage Problem*, 67 YALE L.J. 19, 20–23 (1957); Aaron Director & Edward H. Levi, *Law and the Future: Trade Regulation*, 51 NW. U.L. REV. 281, 290–92 (1956); Benjamin Klein, *Tying*, *in* 3 THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW 630, 630–31 (1998); Richard A. Posner, *The Chicago School of Antitrust Analysis*, 127 U. PA. L. REV. 925, 926 (1979).

2. Jefferson Par. Hosp. v. Hyde, 466 U.S. 2, 36 (1984) (O'Connor, J., concurring) (citing BORK, *supra* note 1, at 372–74; PHILIP AREEDA, ANTITRUST ANALYSIS 735 (3d ed. 1981)).

3. Bowman, *supra* note 1, at 23–24, 33.

4. BORK, *supra* note 1, at 374–75.

merging firms.[5] Thus, the vertical merger has been out of the lens of antitrust scrutiny for a long time.[6]

However, post-Chicago scholars such as Professor Salop have set forth the drawbacks of the single-monopoly-profit theory as the reason for the presumptive lawfulness of the vertical merger[7] and aroused attention to what the analytical framework of the vertical merger should be in the federal court system.[8] In detail, post-Chicago legal and economic literature has argued that two types of effects—unilateral and coordinated effects—might occur from a horizontal or vertical merger and hence lessen competition in the future.[9] An anticompetitive effect should first be proven by the government or plaintiff companies. After that, the result of the anticompetitive analysis should be balanced with the procompetitive benefits proven by the merging firms. This balancing concept forms the basis of the burden-shifting model discussed by the Court of Appeals for the D.C. Circuit in the *Baker Hughes* case.[10] In *Baker Hughes*, then Judge Clarence Thomas, writing for the panel, said:

> By showing that a transaction will lead to undue concentration . . . the government establishes a presumption that the transaction will substantially lessen competition. The burden of producing evidence to rebut this presumption then shifts to the defendant. If the defendant successfully rebuts the presumption, the burden of producing additional evidence of anticompetitive effect shifts to the government, and merges with the ultimate burden of persuasion, which remains with the government at all times.[11]

After *Baker Hughes* was decided, more and more federal courts have adopted the framework discussed in *Baker Hughes* to analyze vertical or horizontal merger cases.[12] For instance, in the AT&T–Time Warner vertical merger case, Judge Leon again cited *Baker Hughes* in analyzing

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5. *Id.* at 229.

6. *See* Michael H. Riordan & Steven C. Salop, *Evaluating Vertical Mergers: A Post-Chicago Approach*, 63(2) ANTITRUST L.J. 513 (1995); Steven C. Salop, *Invigorating Vertical Merger Enforcement*, 127 YALE L.J. 1962 (2018).

7. Riordan & Salop, *supra* note 6, at 1969 (Professor Salop argued that the single-monopoly profit theory did not consider the entry barrier established by the monopolist).

8. United States v. AT&T, Inc., 916 F.3d 1029, 1037 (D.C. Cir. 2019) ("Several amici urge this court to speak definitively on the proper legal standard for evaluating vertical mergers.").

9. *See generally* STEVEN C. SALOP & DANIEL P. CULLEY, POTENTIAL COMPETITIVE EFFECTS OF VERTICAL MERGERS: A HOW-TO GUIDE FOR PRACTITIONERS 1392 (2014) (explaining the competitive harms that can result from vertical mergers).

10. *See generally* United States v. Baker Hughes Inc., 908 F.2d 981 (D.C. Cir. 1990).

11. *Id.* at 984.

12. *See generally* FTC v. Cardinal Health, 12 F. Supp. 2d 34 (1998); Chi. Bridge & Iron Co. N.V. v. FTC, 534 F.3d 410, 426 (5th Cir. 2008); Fjord v. AMR Corp. (*In re* AMR Corp.), 625 B.R. 215, 244, 247 (2021).

section 7 of the Clayton Act.[13] Moreover, in the Aetna–Humana horizontal merger case, Judge Bates also cited *Baker Hughes* to emphasize that "D.C. Circuit precedent creates a burden-shifting framework to guide that inquiry."[14] As a result, we find that the burden-shifting framework has been widely adopted by the federal courts in dealing with both vertical and horizontal merger cases.

Because of the widespread adoption of the balancing model instead of presumptive lawfulness, it is important to understand the detailed analysis of unilateral and coordinated effects arising from vertical mergers. First, the unilateral effects of a merger usually come from foreclosure at either the upstream or downstream level. That is, if the upstream merging firms control valuable inputs supplied to the downstream firms, the downstream rivals might not have access to those inputs because of the merger. This situation is called "input foreclosure."[15] As for the upstream rivals, they also might be foreclosed if the merger succeeds, since the downstream merging firms control vital distribution for the upstream rivals. This is called "customer foreclosure."[16] In any given merger, both foreclosure effects might happen at the same time.

In addition to the unilateral effects, coordinated effects might also occur if the merger succeeds. That is, the upstream rivals have incentives to collude with the upstream merging firms if the merger succeeds. One of the incentives for them to collude is that the downstream merging firms provide vital distribution for all upstream firms.[17] This is called the "upstream-collusion effect." However, what if some inputs are proprietary and important to all the downstream firms? Would the downstream merging firms and rivals have incentives to collude with one another? This question theoretically is called the "downstream-collusion effect." Unfortunately, this type of effect has not been deeply discussed in academic literature until now. Even the latest version of the Vertical Merger Guidelines issued by the Department of Justice (DOJ) and the

13. *AT&T, Inc.*, 916 F.3d at 1037 n.8.

14. United States v. Aetna Inc., 240 F. Supp. 3d 1, 18 (2017).

15. *See generally* Patrick Bolton & Michael D. Whinston, *The "Foreclosure" Effects of Vertical Mergers*, 147 J. INSTITUTIONAL & THEORETICAL ECON. (JITE) / ZEITSCHRIFT FÜR DIE GESAMTE STAATSWISSENSCHAFT 207 (1991) (analyzing the interaction between upstream firms and downstream firms under an input-supply-contract).

16. *See generally* Steven C. Salop & Daniel P. Culley, *Revising the US Vertical Merger Guidelines: Policy Issues and an Interim Guide for Practitioners*, 4 J. ANTITRUST ENFORCEMENT 1 (2016) (stating that company rivals and consumers can suffer harm when a downstream firm refused to buy inputs from input suppliers in a vertical merger).

17. Volker Nocke & Lucy White, *Do Vertical Mergers Facilitate Upstream Collusion?*, 97(4) AM. ECON. REV. 1321, 1321 (2007).

Federal Trade Commission (FTC) in June 2020 did not thoroughly discuss the possibility of the downstream-collusion effect.[18]

To fill this gap, this Article analyzes the competitive harm of the downstream-collusion effect in the vertical merger context. More importantly, another goal of this Article is to determine how to integrate the idea of the downstream-collusion effect analysis into the burden-shifting framework so that federal courts can use it in the future.

The following Parts I and II thoroughly discusses the literature relating to the coordinated effect analysis in the vertical merger context to determine whether previous comments or research has discussed similar issues. We find that although some literature talks about the upstream-collusion effect, rarely does the literature analyze the effect of downstream collusion.

Part III explains why the antitrust agencies need to analyze downstream collusion, that is, the theory of the harm of the downstream-collusion effect in the vertical merger context. We use economic models to explain the problem of downstream collusion and discuss how the scale of the saved unit cost or downstream cost and the level of heterogeneity between two downstream firms' final goods affect the incentives of downstream-collusive behavior.

In Part IV, after explaining the theory of harm for the downstream-collusion effect, we integrate the economic concept explained in Part III into the antitrust guidelines and the burden-shifting framework. Furthermore, we provide an introduction to and critiques of the AT&T–Time Warner merger case, a phenomenal recent vertical merger case. Finally, we take the case of the AT&T–Time Warner merger as an example to elaborate on how our updated burden-shifting framework could be applied to a real case. Part V concludes.

I. MOST LEGAL LITERATURE HAS NOT DISCUSSED THE COORDINATED EFFECT OF A VERTICAL MERGER

The coordinated effect has been recognized as a principle of the *ex-ante* merger review for a long time.[19] However, how to analyze this effect under the vertical merger review is still unclear, not to mention the additional analysis of the downstream-collusion effect. To be more specific, the 1992 Merger Guidelines reveal that, "[a] merger may

18. *See* U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, VERTICAL MERGER GUIDELINES, § 5 (2020).

19. *See* Janusz A. Ordover, *Coordinated Effects*, *in* 2 ISSUES IN COMPETITION LAW AND POLICY, 1359, 1381 (2008); William E. Kovacic et al., *Quantitative Analysis of Coordinated Effects*, 72 ANTITRUST L.J. 397, 425–26 (2009); Natalia Fabra & Massimo Motta, *Assessing Coordinated Effects in Merger Cases*, *in* 2 HANDBOOK OF GAME THEORY AND INDUSTRIAL ORGANIZATION, 91, 91–122 (Luis C. Corchón & Marco A. Marini eds., 2018); Simon Loertscher & Leslie M. Marx, *Coordinated Effects in Merger Review*, 64 J.L. & ECON. 705, 705–06 (2021).

diminish competition by enabling the firms selling in the relevant market more likely, more successfully, or more completely to engage in coordinated interaction that harms consumers."[20]

The coordinated effect can also be found in the 1984 Non-Horizontal Merger Guidelines,[21] the 2010 Horizontal Merger Guidelines,[22] and the 2020 revision of the Vertical Merger Guidelines.[23] In detail, the 2010 Horizontal Merger Guidelines say that "[a] merger may diminish competition by enabling or encouraging post-merger coordinated interaction among firms in the relevant market that harms customers."[24] By comparison, the 2020 revision of the vertical merger guidelines says that "[i]n some cases, a vertical merger may diminish competition by enabling or encouraging post-merger coordinated interaction among firms in the relevant market that harms customers."[25]

Comparing these three guidelines, we can see that antitrust agencies have recognized the importance of the coordinated effect and that it should be analyzed in either horizontal or vertical merger reviews. However, in terms of the antitrust guidelines that apply to a horizontal merger, we cannot see that the 1992 Merger Guidelines or the 2010 Horizontal Merger Guidelines provide any thorough analysis of the coordinated effect. For instance, the 2010 Horizontal Merger Guidelines say only,

> The Agencies seek to identify how a merger might significantly weaken competitive incentives through an increase in the strength, extent, or likelihood of coordinated conduct. There are, however, numerous forms of coordination, and the risk that a merger will induce adverse coordinated effects may not be susceptible to quantification or detailed proof.[26]

Regarding the guidelines that apply to a vertical merger, we do not see any specific details to analyze the coordinated effect either. That is, the 2020 revised Vertical Merger Guidelines only refer to the same factors in the 2010 Horizontal Merger Guidelines. For instance, § 5 of the 2020 revised Vertical Merger Guidelines says, "[t]he theories of harm discussed in the Horizontal Merger Guidelines, as well as those discussed

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20. U.S. DEP'T OF JUST. & FED. TRADE COMM'N, MERGER GUIDELINES, § 2.1 (1992).

21. U.S. DEP'T OF JUST., NON-HORIZONTAL MERGER GUIDELINES (1984), www.justice.gov/atr/public/guidelines/2614.pdf [https://perma.cc/2N4L-DUVZ].

22. *See* U.S. DEP'T OF JUST. & FED. TRADE COMM'N, HORIZONTAL MERGER GUIDELINES, § 7 (2010).

23. VERTICAL MERGER GUIDELINES, *supra* note 18, § 5.

24. HORIZONTAL MERGER GUIDELINES, *supra* note 22, §7.

25. VERTICAL MERGER GUIDELINES, *supra* note 18, § 5.

26. HORIZONTAL MERGER GUIDELINES, *supra* note 22, § 7.1.

below, are not exhaustive, but rather are illustrations of the manner in which a merger may lessen competition due to coordinated effects."[27]

Based on the language above, we could infer that antitrust agencies have recognized that the coordinated effect should be analyzed in either horizontal or vertical merger review. However, they have not provided a specific framework for analyzing the coordinated effect in the vertical merger context.

Because antitrust agencies have failed to provide a framework for horizontal or vertical coordinated-effect analysis, many legal scholars have various ideas about what the framework should be. Unfortunately, most discussions only focus on the analysis of the coordinated effect on horizontal mergers, not on vertical mergers.

For instance, in his earlier well-known research, Professor Baker focused on the role of the maverick and how a merger affects the industry in which the maverick resides.[28] To be more specific, Professor Baker first recognized that the coordinated effect had been ignored by the antitrust jurisprudence in the early twenty-first century.[29] Next, he argued that identification and analysis of the maverick in a merger review were important because the maverick could mitigate the coordinated effect of a merger.[30] Thus, if the antitrust agencies could adopt the perspective of the maverick in the merger review, they could reduce the error cost, the cost of the agencies wrongfully allowing a harmful merger.[31]

Finally, Professor Baker applied the concept of the maverick to the airline merger case by looking at several hypothetical scenarios and analyzing the harm to the consumers: the loss of a maverick, the loss of a non-maverick with no incentive effects, beneficial or harmful incentive effects on the maverick, and the creation of a new maverick.[32] These arguments were again discussed in his recent paper, which raised the concern that greater concentration could also lead to a serious coordinated effect.[33]

Although Professor Baker's research has thoroughly discussed the interrelation between the coordinated effect and the importance of the maverick to the merger review, this type of interrelation might only be applicable to the horizontal merger, not to the vertical merger. To be more specific, his research mentioned that the concern of oligopoly conduct

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27. VERTICAL MERGER GUIDELINES, *supra* note 18, § 5.

28. Jonathan B. Baker, *Mavericks, Mergers, and Exclusion: Proving Coordinated Competitive Effects Under the Antitrust Laws*, 77 N.Y.U.L. REV. 135, 135 (2002).

29. *Id*. at 142–43.

30. *Id*. at 177–80.

31. *Id*. at 185–88.

32. *Id*. at 195–99.

33. Jonathan B. Baker & Joseph Farrell, *Oligopoly Coordination, Economic Analysis, and the Prophylactic Role of Horizontal Merger Enforcement*, 168 U. PA. L. REV. 1985, 2017 (2020).

was discussed in *Brown Shoe Co. v. United States*[34] and *United States v. Philadelphia National Bank.*[35] These two important U.S. Supreme Court cases were related to horizontal mergers, not vertical mergers. That is, the *Brown Shoe* case was about the merger between the third-largest seller of shoes, Brown Shoe, and Kinney, the eighth-largest.[36] The *Philadelphia National Bank* case was related to the merger of a national bank and a state bank, the second- and third-largest of the 42 commercial banks in the metropolitan area.[37] These two cases are both horizontal mergers, and the reasoning in them might not be applicable in vertical cases.

In addition to Professor Baker, several other legal scholars have also studied the coordinated effect in the horizontal merger.[38] One of the well-known ones is Professor Harrington, Jr. In his research, he criticized the inclusion of parallel accommodating conduct (PAC) in the 2010 Horizontal Merger Guidelines because PAC could not sustain the characteristics of retaliation or deterrence.[39] Moreover, PAC does not have the "agreed-upon market outcome."[40]

As for the first argument, Professor Harrington argued that the inclusion of PAC in the 2010 Horizontal Merger Guidelines suggested that there was no monitoring or punishment that would prove the coordinated effect under horizontal merger review because PAC was contrary to the theory of collusion.[41] Moreover, Professor Harrington argued that in the scenario when the merged firm is a price leader and two firms observe the behavior of each other, it is difficult to analyze whether the price leader offering a customer-specific discount should be categorized as PAC.

As for the second argument, Professor Harrington argued that the coordinated effect may still occur when merged firms and other firms have little mutual understanding of prices, which is contrary to the theory of collusion under section 1 of the Sherman Act.[42]

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34. Brown Shoe Co. v. United States, 370 U.S. 294, 333 (1962).

35. United States v. Phila. Nat'l Bank, 374 U.S. 321, 367–68 (1963).

36. *See* Brown Shoe Co., 370 U.S. at 296.

37. *See* Phila. Nat'l Bank, 374 U.S. at 323.

38. *See* Jonathan Baker, *Why Did the Antitrust Agencies Embrace Unilateral Effects?*, 12 GEO. MASON L. REV. 31, 31–32 (2003); William J. Kolasky, Deputy Assistant Att'y Gen., Antitrust Div., U.S. Dep't Just., Address Before the ABA Section of Antitrust Law Spring Meeting: Coordinated Effects in Merger Review: From Dead Frenchmen to Beautiful Minds and Mavericks (Apr. 2002); Wayne-Roy Gayle et al., *Coordinated Effects in the 2010 Horizontal Merger Guidelines*, 39 REV. INDUS. ORG. 39, 40–41 (2011).

39. Joseph E. Harrington, *Evaluating Mergers for Coordinated Effects and The Role of "Parallel Accommodating Conduct,"* 78(3) ANTITRUST L. J. 651, 651–53 (2013).

40. *Id.* at 655.

41. *Id.* at 660.

42. *Id.* at 663.

Similar to Professor Baker's research, although Professor Harrington provided two well-rounded arguments about the 2010 Horizontal Merger Guidelines, his research did not discuss the role of the coordinated effect in vertical merger review. Instead, he specifically focused on the effect of PAC on the Horizontal Merger Guidelines. Unfortunately, how to analyze the coordinated effect under vertical merger review has been ignored.

In terms of the vertical merger guidelines, it is important to further investigate legal research conducted after the 2020 revision of the Vertical Merger Guidelines was promulgated. However, to the best of our knowledge, no legal research has thoroughly investigated the coordinated effect in a vertical merger. Most critiques focus on the unilateral effect—that is, the foreclosure effect—of the vertical merger. For instance, Professor Shapiro, as the economic expert witness for the AT&T–Time Warner Case (we will introduce this case in Part IV), argued that three steps need to be analyzed in the input foreclosure of the vertical merger.[43]

First is the ability of the merged firms to weaken the rivals. This step has two further inquiries: (a) whether the input controlled by the merged firms is important to the downstream rivals[44] and (b) whether the downstream rivals would increase their cost if the input were foreclosed.[45] This subfactor is related to the question of whether the downstream rivals have other input alternatives to choose from.[46]

Second is whether the end consumers of the downstream rivals would divert to the merged firms because of the foreclosure and whether this situation would lead to an increase in the merged firms' profits.[47] It is also important here to investigate whether the downstream rivals have other alternative inputs from other upstream firms.[48]

Third is the effect of the EDM.[49] Professor Shapiro reasoned that this three-step framework fit with the 2020 revision of the Vertical Merger Guidelines because in section four of the guidelines, the antitrust agencies addressed the ideas of ability/incentives conditions for the vertical merger analysis.[50] These two conditions are matched by the first and second steps of the framework above.[51]

Another well-known study about the 2020 revision of the Vertical Merger Guidelines is by Professor Salop. In his paper, he suggested that

43. Carl Shapiro, *Vertical Mergers and Input Foreclosure Lessons from the AT&T/Time Warner Case*, 59 REV. INDUS. ORG. 303, 332 (2021).

44. *Id.* at 305–06.

45. *Id.*

46. *Id.*

47. *Id.*

48. *Id.*

49. *Id.*

50. *Id.* at 309–10.

51. *Id.*

the 2020 revision of the Vertical Merger Guidelines should have more details about the harm from the coordinated effect of a vertical merger.[52]

Specifically, he explained three possible coordinated effects of a vertical merger through hypothetical examples. First, it may weaken a non-merging disruptive competitor in the downstream relevant market. Second, it could also reduce the upstream merging firms' incentives to defect in a relevant upstream market.[53] Third, the merged firm could have access to rivals' sensitive information, which could lead to collusion in both the upstream and downstream markets.[54]

Finally, Professor Salop argued that the 2020 revision of the Vertical Merger Guidelines should consider the following situations as presumptively anticompetitive in the vertical merger review. That is, the merged firms must prove that the following situations are not anticompetitive or even procompetitive. First, one of the merged firms is the dominant platform. Second, the merger might eliminate potential entrants or a maverick seller or buyer. Third, the merged firms involve the long-term contract of input supplies or selling complementary products that might raise the price of a bundle.[55]

Both Professors Shapiro and Salop thoroughly discussed the framework of and suggestions for the 2020 revision of the Vertical Merger Guidelines. However, neither of them has provided a theory of the harm of the coordinated effect in the vertical merger context. Specifically, Professor Shapiro dissected the logic behind the unilateral effect of a vertical merger and justified his arguments in the AT&T–Time Warner case. He did not discuss the possibility of harm from the coordinated effect, even though that effect was well accepted by the previous 1992 Merger Guidelines.[56] Similarly, although Professor Salop provided some examples of the harm of the coordinated effect in the vertical merger context, he provided the possible results of the coordinated effect without solid economic justifications.

II. ONLY A FEW ECONOMIC STUDIES HAVE DISCUSSED THE COORDINATED EFFECT IN THE VERTICAL MERGER CONTEXT

The economic literature seems to parallel the legal discussions. That is, most economic literature has mainly focused on the analysis of the coordinated effect in the horizontal merger context, not that of vertical mergers. For instance, Professor Compte and his team used the Bertrand-Edgeworth price competition model with diverse capacities to analyze

52. Steven C. Salop, *A Suggested Revision of the 2020 Vertical Merger Guidelines,* 67 ANTITRUST BULL. 371, 371 (2021).

53. *Id.* at 383–84.

54. *Id.* at 384.

55. *Id.* at 388–89.

56. MERGER GUIDELINES, *supra* note 20, § 2.

the tacit collusion in an infinite repetition game with the same discount factors.[57] The purpose was to characterize in which capacity collusion could be sustainable.[58] Furthermore, Professor Compte and his team considered whether a different distribution of the market shares might also affect the characterization[59] and whether a merger affects tacit collusion.[60] They found that a merger could reduce the number of competitors, so the merger would facilitate collusion.

However, this well-known effect occurs only when capacity constraints are not too severe. Contrarily, when the capacity constraints are severe and the merger involves a firm with the largest market share, the asymmetry in capacities could be exacerbated and could decrease tacit collusion.[61] The key reason in that circumstance being small firms could not retaliate even if the merged firm deviated because the capacities of those small firms might be transferred to the merged firm.[62] Moreover, the merged firm would not deviate since it might lose some gains due to the capacity constraints.[63] Professor Compte and his team inferred that the Herfindahl-Hirschman Index (HHI) sometimes does not indicate that analysis of a horizontal merger is necessary, which implicates policy considerations.[64]

Also investigating the relationship between mergers and collusion, Professor Vasconcelo designed a model in which a number of firms decide what output they would make in the same market for infinite periods.[65] Interestingly, Professor Vasconcelo let those firms own different capital.[66] Thus, each firm would have different output and capital distributions.[67] Professor Vasconcelo's model similarly showed that HHI is sometimes not a reliable indicator for two reasons.

First, if a company is the smallest one in the industry, a merger could affect the collusion possibilities only if that merger could change the size of that smallest firm.[68] This is because if the size of the smallest firm increases, the incentives to change the collusive scheme are decreased

57. Olivier Compte et al., *Capacity Constraints, Mergers and Collusion*, 46 EUR. ECON. REV. 1, 1–2 (2002).

58. *Id.* at 5–7.

59. *Id.*

60. *Id.*

61. *Id.* at 8–10.

62. *Id.* at 15.

63. *Id.* at 19.

64. *Id.* at 25.

65. Helder Vasconcelos, *Tacit Collusion, Cost Asymmetries, and Mergers*, 36 RAND J. ECON. 39, 41 (2005).

66. *Id.* at 43.

67. *Id.*

68. *Id.* at 50–51.

and the symmetry of capital distribution is increased.[69] Therefore, collusion is facilitated.

Second, if a small company is not the smallest one in the industry but is a relatively small company, the effect of a merger on the collusive scheme depends on which type of firm is affected. If the size of the small company is affected, then this case is the same as the previous one and is anticompetitive.[70] On the other hand, if the size of the largest firm is affected, then the asymmetry of capital distribution will be increased, and the collusion incentives will be diminished.[71]

The intertwining of collusion and merger review seems to still be at the center of research. In a recent study, Professors Farrell and Baker sought to fill the gap between the adoption of the static Nash equilibrium model and oligopoly super game models for horizontal merger review.[72] The reason to do so, they found, is that most antitrust analyses of the coordinated effect in horizontal merger review assume that each firm's choice will not affect its rival.[73] This assumption does not consider the responses (retaliation or deterrence) of rivals.[74] In order to fill this gap, Professors Farrell and Baker designed a model by linking the incentive effect of the Stackelberg response to the concept of the diversion ratio.

By comparing the prices between the static Nash equilibrium model and the Stackelberg model within the pre- and post-merger analysis, Professors Farrell and Baker found two things. First, with models designed with three-product behavior in the merger context, the prices are higher in the Stackelberg model than in the static Nash equilibrium model.[75] Second, the price difference between the two models grows as the diversion ratio increases.[76] These two conclusions implied that the static Nash equilibrium model could yield erroneous estimates for horizontal merger review when Stackelberg behavior occurs in pre and post-merger.[77] Therefore, the antitrust agencies should consider the coordinated effect of the horizontal merger, which may have behavioral changes from the static Nash model to Stackelberg behavior, which may be correlated with the diversion ratio.[78]

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69. *Id.*
70. *Id.* at 53–55.
71. *Id.* at 57.
72. Joseph Farrell & Jonathan B. Baker, *Natural Oligopoly Responses, Repeated Games, and Coordinated Effects in Merger Analysis: A Perspective and Research Agenda*, 58 REV. INDUS. ORG. 103, 111–12 (2021).
73. *Id.* at 110–13.
74. *Id.* at 114.
75. *Id.* at 130.
76. *Id.* at 133.
77. *Id.* at 134.
78. *Id.*

Recently, some economic literature has started to shift its attention to the coordinated effect in the vertical merger context. Unfortunately, most of the literature has only focused on the upstream-collusion effect in vertical mergers rather than the downstream-collusion effect. For example, the most well-known research about collusion and vertical mergers was developed by Professors Nocke and White.[79] They focused on the analysis of upstream collusion by designing a repeated game in which multiple upstream manufacturers without capacity limitations supplied homogeneous intermediate goods to multiple downstream firms.[80] Next, those downstream firms would purchase the intermediate goods and remanufacture them into homogeneous or differential final goods for the end consumers.[81] Through this, they deduced that two effects need to be analyzed to assess upstream collusion in vertical mergers.

The first is the outlets effect. This effect theorizes that when upstream rivals do not have many downstream firms—outlets—to supply their intermediate goods to, the upstream rivals will have fewer incentives to deviate if they collude with one another after the vertical merger succeeds.[82] Thus, the vertical merger could facilitate upstream collusion. The other effect is the punishment effect. Contrarily, this effect theorizes that the upstream affiliate would like to deviate after the vertical merger because the merged entity could make more profits than when the standalone upstream affiliate colludes with other upstream rivals.[83] Analyzing the repeated game, Professors Nocke and White found that the outlets effect would always outweigh the punishment effect if the vertical merger succeeded.[84] Therefore, the vertical merger could facilitate upstream collusion.

All of the economic research above was profound. It not only found possible causal relationships between a firm's capacity constraints and tacit collusion but also deduced the effect of the merger on the collusive behavior. However, these recent economic studies only discussed horizontal mergers.[85] The analysis of the coordinated effect of a vertical

79. Volker Nocke & Lucy White, *Do Vertical Mergers Facilitate Upstream Collusion*?, 97 AM. ECON. REV. 1321, 1321 (2007). For more discussion on relaxing some assumptions of the models see Volker Nocke & Lucy White, *Vertical Merger, Collusion and Disruptive Buyers*, 28 INT'L J. INDUS. ORG. 350 (2010).

80. Nocke & White, *Do Vertical Mergers Facilitate Upstream Collusion*?, *supra* note 79, at 1322.

81. *Id.*

82. *Id.*

83. *Id.* at 1331.

84. *Id.* at 1335.

85. Recent discussions about the coordinated effect in the horizontal merger context can be found in Robert H. Porter, *Mergers and Coordinated Effects*, 73 INT'L J. INDUS. ORG. 102583

merger has been ignored by most economic experts. Moreover, although some research about the relationship between collusion and vertical mergers has been studied, the discussion only focuses on the vertical merger and its effect on upstream collusion.[86] The possibility of the vertical merger having a downstream-collusive effect has been ignored by most economic experts. Thus, in the next part, Part III, we explain why the downstream-collusive effect in the case of the vertical merger should also be considered as the possible harm of the merger.

III. THEORY OF HARM FOR THE DOWNSTREAM-COLLUSION EFFECT UNDER THE VERTICAL MERGER CONTEXT

Suppose there are two upstream firms and two downstream firms. The two upstream firms, U_1 and U_2, can produce homogeneous intermediate goods unlimitedly at the unit cost of w and proceed with Bertrand competition. In each period, the two downstream firms, D_1 and D_2, decide the amount of intermediate goods bought from U_1 and U_2 and transform intermediate goods into heterogeneous final goods on a one-to-one basis at zero cost. Accordingly, the two downstream firms proceed with Cournot competition.

Without vertical integration, downstream firms suffer some proportional transaction costs. The transaction costs may come from the negotiation cost, the contracting cost, the insurance premium against the breach of the contract, or the enforcement cost of the contract. Some of these costs could be increased in the amounts of transactions. The disappearance of transaction costs can also be considered as the enhancement of economic efficiency. Suppose that an upstream firm charges c for each unit of intermediate goods. The actual cost a downstream firm needs to pay is $\alpha \cdot c, \alpha > 1$. A downstream firm can save transaction cost by the amount of $(\alpha - 1) \cdot c$ after being integrated vertically.

The market demand for $D_1's$ final goods is

$$P_1 = 1 - q_1 - b \cdot q_{-1}, b \in (0,1),$$

where P_i is the price charged by D_i and q_i is the quantity sold by D_1. We use b to measure the homogeneity between two downstream firms' final goods. When b approaches 1, it is close to the case of homogeneous

(2020) and Simon Loertscher & Leslie M. Marx, *Coordinated Effects in Merger Review*, 64 J. L. & ECON. 705 (2021).

86. Extensive research about upstream collusion can be found in Hans-Theo Normann, *Vertical Integration, Raising Rivals' Costs and Upstream Collusion*, 53 EUR. ECON. REV. 461 (2009).

goods. Further, we require $1 - \alpha \cdot w - b \cdot (1 - w) > 0$ to ensure that all firms remain in the market.

To discuss the possibility of collusion, the game is assumed to play repeatedly. Further, with perfect information, this game in each period can be solved by backward induction. The decision order in each period is as follows.

Stage 1: U_1 and U_2 simultaneously decide the price of intermediate goods c_1 and c_2.

Stage 2: D_1 and D_2 simultaneously decide suppliers and the amount of intermediate goods, q_1 and q_2, to procure.

Stage 3. D_1 and D_2 simultaneously produce final goods and sell to customers.

Social welfare can be measured by the sum of consumers' utility and all firms' profits. Under Bertrand competition, upstream firms will earn zero profits. On the supply side, we will discuss downstream firms' profits only. With the assumption of linear demand for heterogeneous products, consumers' utility comes from

$$\mathrm{U}(q_1, q_2) = (q_1 + q_2) - \frac{1}{2}(q_1^2 + q_2^2) - b \cdot q_1 \cdot q_2 + (Y - P_1 \cdot q_1 - P_2 \cdot q_2),$$

where *Y* denotes consumers' income.

Two scenarios are discussed below, depending on whether U_1 and D_1 are vertically integrated or not.

A. *Solving the Model*

Scenario I: U_1 and D_1 are NOT vertically integrated.

Since U_1 and U_2 proceed with Bertrand competition, they will both charge $c_1 = c_2 = w$. It does not matter for downstream firms where to buy intermediate goods, and neither U_1 nor U_2 enjoys positive profits. Without forming a cartel, D_1 chooses q_1 independently to maximize its profits:

$$(1 - q_1 - b \cdot q_{-1} - \alpha \cdot w)q_1.$$

By asymmetry,

$$q_1 = q_2 = q = \frac{1 - \alpha \cdot w}{b + 2}, P_1 = P_2 = P = 1 - (1 + b)q,$$

and each firm earns

$$\pi_1 = \pi_2 = \pi = [1 - (1 + b)q - \alpha \cdot w]q.$$

If downstream forms collude tacitly, they will maximize their joint profits.

$$\max_{q_1^c,\, q_2^c}(1 - q_1^c - b \cdot q_2^c - \alpha \cdot w)\, q_1^c + (1 - b \cdot q_1^c - q_2^c - \alpha \cdot w) q_2^c$$

The superscript *c* indicates the case of tacit collusion between D_1 and D_2.

Thus,

$$q_1^c = q_2^c = q^c = \frac{1 - \alpha \cdot w}{2(b+1)}, P_1^c = P_2^c = P^c = 1 - (1+b)q^c,$$

and each firm earns

$$\pi_1^c = \pi_2^c = \pi^c = [1 - (1+b)q^c - \alpha \cdot w]q^c.$$

Without loss of generality, assume that D_1 deviates from the tacit collusion, and let the superscript *d* indicate the case of a downstream firm's deviation. Then, D_1, given $q_2 = q_2^c$, chooses q_1^c to maximize

$$\pi_1^d = \left(1 - q_1^d - b \cdot q_2^c - \alpha \cdot w\right)q_1^d.$$

Thus,

$$q_1^d = \frac{b+2}{4(b+1)}(1 - \alpha \cdot w), P_1^d = 1 - q_1^d - b \cdot q_2^c,$$

and D_1 earns

$$\pi_1^d = (1 - q_1^d - b \cdot q_2^c - \alpha \cdot w).$$

Assume that downstream firms adopt the grim trigger strategy, which can support any payoff portfolio between the deviation phase and the cooperation phase. D_1 will not deviate when

$$\frac{\pi_1^c}{1 - \delta_1} \geq \pi_1^d + \frac{\delta_1 \cdot \pi_1}{1 - \delta_1}, \text{ or } \delta_1 \geq \bar{\delta_1} \equiv \frac{\pi_1^d - \pi_1^c}{\pi_1^d - \pi_1},$$

where $\delta_1 \in (0,1)$ is the discount rates of D_1. Similarly, when D_2 deviates, D_1 earns $\pi_2^d = \pi_1^d = \pi^d$, and D_2 will not deviate if $\delta_2 \geq \bar{\delta_2} = \bar{\delta}$. Indeed, $\bar{\delta}$ can be considered as an indicator of a firm's willingness to collude. It can also be shown that $\pi^d > \pi^c > \pi$. Hence, the grim trigger strategy is an adequate punishment strategy.

Scenario II: U_1 and D_1 are vertically integrated.

After integration, D_1 no longer suffers transaction costs and only pays what U_1 charges, and U_1 continues to compete with U_2 in the market for intermediate goods. Economic efficiency will be enhanced because the transaction cost is waived in the trade between integrated firms. Further, D_1 will enjoy the advantage of low cost in the market of final goods.

We use the subscript I to indicate the scenario of vertical integration. Thus, D_1's problem becomes

$$\max_{q_{1,I}}(1 - q_{1,I} - b \cdot q_{2,I} - w)\, q_{1,I},$$

and D_2's problem,

$$\max_{q_{2,I}}(1 - b \cdot q_{1,I} - q_{2,I} - \alpha \cdot w)\, q_{2,I}.$$

$q_{1,I}$ and $q_{2,I}$ can be solved from the two first-order conditions. Thus, we have

$$q_{1,I} = \frac{2(1-w) - b(1-\alpha \cdot w)}{4 - b^2}, q_{2,I} = \frac{-b(1-w) + 2(1-\alpha \cdot w)}{4 - b^2}.$$

Clearly, $q_{1,I} > q_{2,I}$.

Accordingly,

$$P_{1,I} = 1 - q_{1,I} - b \cdot q_{2,I}, P_{2,I} = 1 - b \cdot q_{1,I} - q_{2,I},$$

and

$$\pi_{1,I} = \big(1 - q_{1,I} - b \cdot q_{2,I} - w\big)q_{1,I}, \pi_{2,I} = \big(1 - b \cdot q_{1,I} - q_{2,I} - \alpha \cdot w\big)q_{2,I}.$$

It can be shown that $\pi_{1,I} > \pi_{2,I}$.

Now assume that D_1 and D_2 collude tacitly. However, asymmetric firms cannot form a cartel easily.[87] To pursue maximized joint profits, the integrated firm needs to seize most of the market. In our model, the high-cost firm could earn less after entering the cartel without side payments. Because side payments are illegal and easily detected, a cartel constructed by firms with asymmetric costs cannot simply pursue maximized profits without extra arrangements.

Similar to Professor Vasconcelos's setting,[88] we assume that D_1 and D_2 have the same market share in terms of products sold before and after

87. *See* Charles F. Phillips, Jr., *Industrial Market Structure and Economic Performance*, 2 BELL J. ECON. & MGMT. SCI. 683 (1971) (book review).

88. Vasconcelos, *supra* note 65, at 42.

forming the cartel. If the profits in the deviation phase are higher than in the cooperation phase and the profits in the cooperation phase are higher than in Nash equilibrium (punishment phase), the cartel can be supported by the grim trigger strategy. Thus, D_1 and D_2 are assumed to maximize joint profits while keeping market share fixed, as in the Nash equilibrium.

$$\underset{q_{1,I}^c,\, q_{2,I}^c}{\text{Max}} \left(1 - q_{1,I}^c - b \cdot q_{2,I}^c - w\right) q_{1,I}^c + \left(1 - b \cdot q_{1,I}^c - q_{2,I}^c - \alpha \cdot w\right) q_{2,I}^c$$

$$\text{s.t. } q_{1,I}^c = k \cdot q_{2,I}^c, \text{where } k = \frac{q_{1,I}}{q_{2,I}}$$

We can obtain

$$q_{2,I}^c = \frac{k(1-w) + (1 - \alpha \cdot w)}{2k^2 + 4 \cdot b \cdot k + 2}.$$

After solving $q_{1,I}^c$ and $q_{2,I}^c$, we may obtain

$$P_{1,I}^c = 1 - q_{1,I}^c - b \cdot q_{2,I}^c, P_{2,I}^c = 1 - b \cdot q_{2,I}^c - q_{2,I}^c,$$

and

$$\pi_{1,I}^c = \left(1 - q_{1,I}^c - b \cdot q_{2,I}^c - w\right) q_{1,I}^c, \pi_{2,I}^c = \left(1 - b \cdot q_{2,I}^c - q_{2,I}^c - \alpha \cdot w\right) q_{2,I}^c.$$

Suppose that D_1 deviates from tacit collusion. D_1, given $q_{2,I} = q_{2,I}^c$, chooses $q_{1,I}^d$ to maximize

$$\pi_{1,I}^d = \left(1 - q_{1,I}^d - b \cdot q_{2,I}^c - w\right) q_{1,I}^d.$$

After solving $q_{1,I}^d$, we may obtain

$$P_{1,I}^d = 1 - q_{1,I}^d - b \cdot q_{2,I}^c,$$

and

$$\pi_{1,I}^d = \left(1 - q_{1,I}^d - b \cdot q_{2,I}^c - w\right) q_{1,I}^d.$$

D_1 will not deviate when

$$\delta_1 \geq \bar{\delta}_{1,I} \equiv \frac{\pi_{1,I}^d - \pi_{1,I}^c}{\pi_{1,I}^d - \pi_{1,I}}.$$

Similarly, D_2, given $q_{1,I} = q_{1,I}^c$, chooses $q_{2,I}^d$ to maximize

$$\pi_{2,I}^d = \left(1 - b \cdot q_{1,I}^c - q_{2,I}^d - \alpha \cdot w\right) q_{2,I}^d.$$

After solving $q_{2,I}^d$, we may obtain

$$P_{2,I}^d = 1 - b \cdot q_{1,I}^c - q_{2,I}^d,$$

and

$$\pi_{1,I}^d = \left(1 - b \cdot q_{1,I}^c - q_{2,I}^d - \alpha \cdot w\right) q_{2,I}^d.$$

D_2 will not deviate when

$$\delta_2 \geq \bar{\delta}_{2,I} \equiv \frac{\pi_{2,I}^d - \pi_{2,I}^c}{\pi_{2,I}^d - \pi_{2,I}}.$$

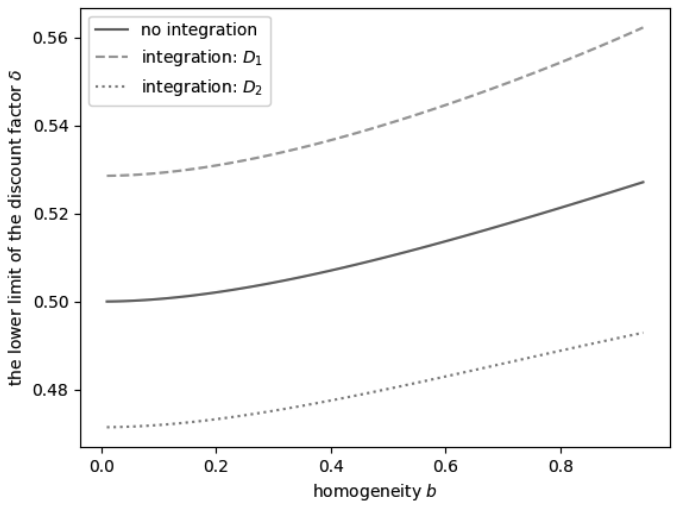
B. *Numerical Example and Graphical Illustration*

We now show that vertical integration could sometimes facilitate the formation of the cartel and the cartel could lower the social welfare in three numerical examples, in which parameters $b, \alpha,$ and w change.

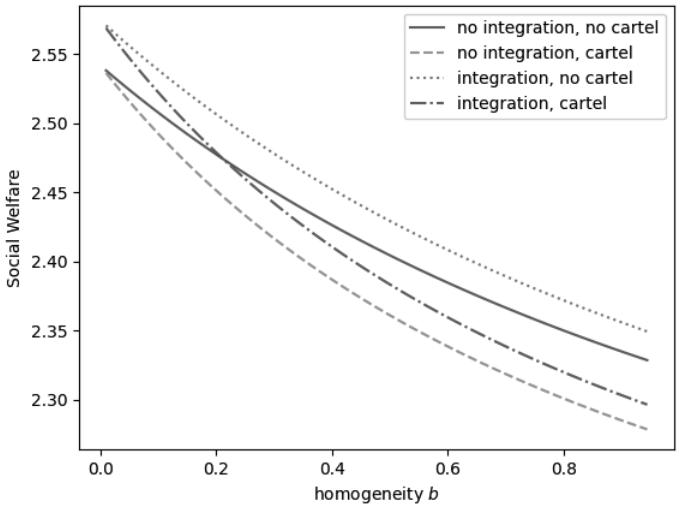
Case 1: $w = 0.1$ and $\alpha = 1.5$

We will see how the homogeneity of the final goods affects the incentive to form a cartel after vertical integration and its impact on social welfare. Note that the upper limit of b will be 0.94, not 1, because we require $1 - \alpha \cdot w - b \cdot (1 - w) > 0$.

Figure 1: Numerical Example When $w = 0.1$ and $\alpha = 1.5$,



Panel A



Panel B

After integration, the incentive to form a cartel will be altered. Figure 1, Panel A shows that the integrated downstream firm's (D_1's) lower limit of the discount factor for the cartel increases after vertical integration. Because D_1 has a lower cost to procure intermediate goods after vertical integration, D_1 will have a lower desire to participate in the cartel. Instead, D_2, the high-cost downstream firm, will have a stronger desire to participate in the cartel after the integration of U_1 and D_1. Overall, it is difficult to say whether vertical integration can trigger tacit collusion between downstream firms or not. However, if D_1 is still willing to form a cartel after vertical integration, it will be easier to form the cartel.

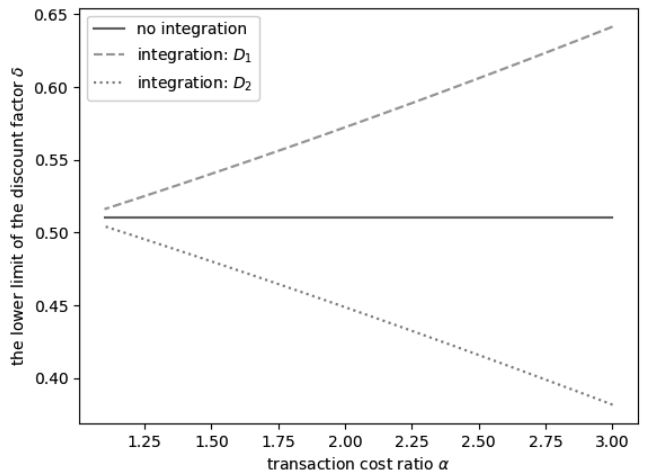
As shown in Figure 1, Panel A, homogeneity of the final products will lower the incentive to form a cartel among downstream firms. Homogeneity will enhance the competition between D_1 and D_2. Thus, the deviation from the cartel can bring more profits even though both downstream firms can earn more from forming a cartel. Note that the gain brought to firms from forming a cartel can hurt consumers. When the homogeneity of the final products is high, the social welfare with vertical integration and a cartel is lower than that without vertical integration and a cartel (please refer to Figure 1, Panel B). In such a case, consumers' loss from the cartel cannot be compensated for by the gain of efficiency from vertical integration.

Case 2: $b = 0.5$ and $w = 0.1$

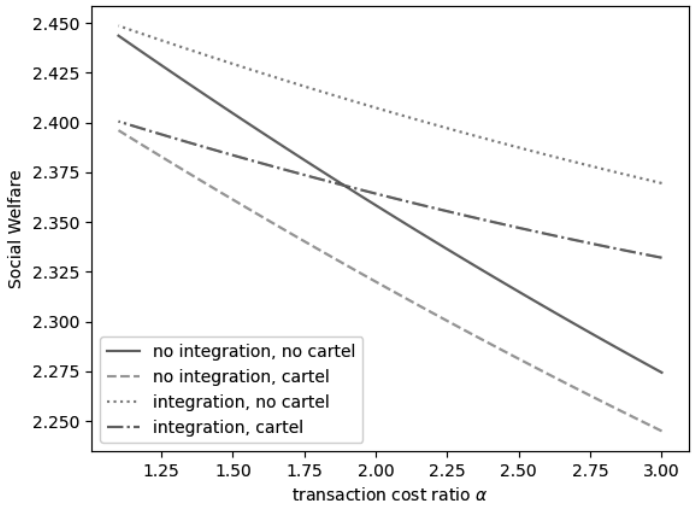
While holding the homogeneity of final goods and the production cost of intermediate goods fixed, we will discuss the impact of the proportion of transaction costs. We set the range of the proportion of transaction costs from 10% to 200%, that is, α is between 1.1 and 3. We believe that we are discussing the most likely cases in the real world.

High transaction costs only hurt the unintegrated downstream firm D_2. Recall that vertical integration can save transaction cost by the amount of $(\alpha - 1) \cdot w$. The higher α is, the more transaction cost is saved. Figure 2, Panel A clearly shows that D_2 will be more willing to tacitly collude when transaction costs are high. Instead, the integrated downstream firm D_1 will have more competence and less desire to form a cartel. Similarly, it is unclear whether vertical integration triggers tacit collusion. If D_2 has a lower discount rate originally, vertical integration could be facilitated more easily.

Figure 2: Numerical Examples When $b = 0.5$ and $w = 0.1$



Panel A



Panel B

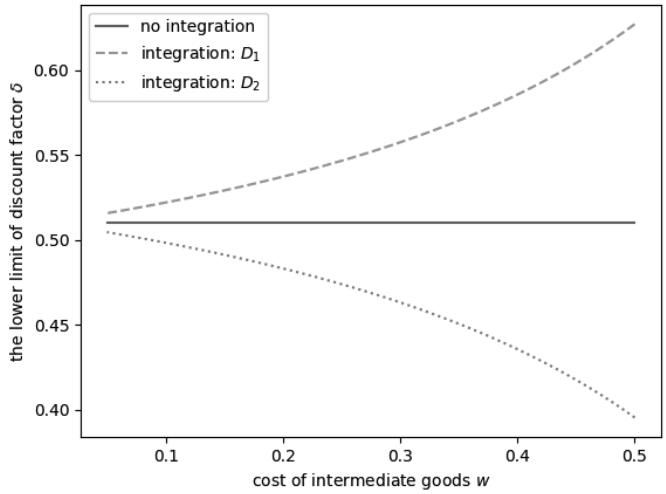
Transaction costs simply hinder economic efficiency. Therefore, the higher transaction costs are, the lower social welfare is (please refer to Figure 2, Panel B). Vertical integration can enhance efficiency or social welfare when transaction costs are high. We also can find in Figure 2, Panel B that the gain from vertical integration can outweigh the loss from the cartel in the case of high transaction costs.

Case 3: $b = 0.5$ and $\alpha = 1.2$

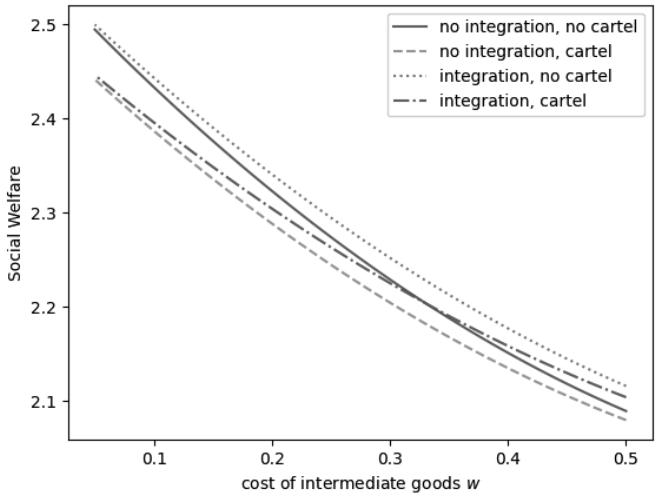
Now we turn to the changes in the cost of intermediate goods *w*. We allow *w* to vary between 0.05 and 0.5. Since the price of final goods must be lower than 1, the range of *w* can be considered large. In terms of the percentage of the highest price in theory, we have already discussed the case of 5% to 50%. Without transaction costs, the high production cost of intermediate goods delivers the same impacts to both downstream firms. However, because of the assumption of proportional transaction cost, vertical integration can save more cost in the case of high *w*, the same as in the case of high α.

As a result, Figure 3 is fairly similar to Figure 2. In addition to the different x-axis, social welfare is more sensitive to *w* than to α in Panel B. We do not reach a different inference here than in the case of variant portions of transaction costs.

Figure 3: Numerical Examples When $b = 0.5$ and $\alpha = 1.2$



Panel A



Panel B

C. *Discussion*

Through the numerical analysis from Figures 1–3, we can deduce the following conclusions about downstream collusion. First, if vertical integration will not trigger the formation of a cartel and will not expel the unintegrated competitor from the market, then vertical integration will increase social welfare. Second, when the industry structure is

asymmetric downstream and the low-cost or strong downstream firm is integrated, we need to check two things: (1) whether the low-cost or strong integrated downstream firm has the potential to collude and (2) whether the high-cost or weak unintegrated firm is expelled from the market. The logic behind these arguments is that the high-cost or weak unintegrated firm will desire collusion more than its competitor both before and after integration. Hence, the attitude of the low-cost or strong downstream firm toward tacit collusion will be key to the success of tacit collusion.

If the low-cost or strong integrated downstream firm only has a little willingness before integration, vertical integration will dilute its desire to collude further, and tacit collusion will become more unlikely. But the difference between two downstream firms is enlarged after vertical integration. We need to carefully evaluate whether the high-cost or weak downstream firm can remain in the market after vertical integration. In our model, the competency of a firm comes from the low procurement cost after integration. Indeed, the competency can also come from low production cost, high quality, brand loyalty, or any factor that makes the firm's products preferable.

Finally, when the industry structure is asymmetric in the downstream and the high-cost or weak downstream firm is integrated, then tacit collusion is most likely to occur because the asymmetry between downstream firms is reduced. In a nutshell, when tacit collusion could be triggered by vertical integration, we seek to evaluate whether the gain of integration can outweigh the loss from potential collusion. Specifically, two scenarios should be considered: (1) when the heterogeneity is high (b is small), the loss from potential collusion will be small; (2) when transaction costs are high (α is large), the gain from integration will be large. Under these conditions, if vertical integration triggers downstream collusion, vertical integration may raise social welfare.

IV. INTEGRATION AND APPLICATION OF THE ECONOMIC CONCEPTS

Based on our model above, we argue that the scale of saved transaction cost and the level of heterogeneity can affect the incentives of downstream firms to collude and the magnitude of the social welfare impact. Thus, we argue that the antitrust agencies and federal courts cannot ignore analysis of the coordinated effect in vertical merger cases, especially the harm from downstream collusion. The next question is, how should the antitrust agencies and federal courts apply our concepts in their legal analysis? In the following section, we will discuss how Vertical Merger Guidelines and the burden-shifting framework could integrate our concepts into their analysis. Finally, we take the AT&T–Time Warner merger case as an example to illustrate how blending our

concepts into the burden-shifting model could help federal courts holistically optimize their analysis.

A. *Integrating the Economic Concepts into the Vertical Merger Guidelines*

Before antitrust agencies officially sue merging firms in federal court, it is important for them to strongly believe that a vertical merger could cause more cost than benefit, especially when downstream collusion is likely to be triggered. The idea that downstream collusion can occur should be included in the Vertical Merger Guidelines because the guidelines play a key role in informing the agencies' reasoning in the vertical merger review process.[89] As we discussed earlier, in Panel A of Figures 1 and 2, both the saved transaction costs and the homogeneity of the downstream firms' products or services are related to the cost and the benefit brought by the vertical merger.

From the perspective of the antitrust agencies, the concept of the saved transaction cost ratio could be understood as the effect of the EDM. This effect is one type of efficiency justification for the merging firms to argue in favor of the vertical merger, and it has been written about in the Vertical Merger Guidelines for a long time.[90] However, the integrated downstream firm becomes competitive in the market through a lower cost or the effect of EDM. Thus, the saving on the transaction costs will change the relative competitiveness in the downstream market. The greater the magnitude of the saved cost caused by the EDM, the larger the impact on the relative competitiveness of the downstream market.

The magnitude of saved transaction costs and the competitiveness of the integrated downstream firm before integration can help the antitrust agency determine the effect of the vertical merger. When a strong downstream firm is vertically integrated, the integrated downstream firm will lose the incentive to collude, and the enlarged asymmetry among downstream firms also prevents tacit collusion in the downstream market. In such a case, the antitrust agency should not worry about the harm of coordinated effects, but the market power of the new integrated firm could be a concern. Instead, when a weak firm is vertically integrated, the shrunken asymmetry among downstream firms may promote tacit collusion in the integrated downstream market. Then, the antitrust agency should consider whether the saving of transaction costs outweighs the harm of possible tacit collusion.

Homogeneity among the downstream firms' products and services will promote tacit collusion and will bring more harm when tacit

89. VERTICAL MERGER GUIDELINES, *supra* note 18. For instance, in the Overview part of the 2020 Vertical Merger Guideline, it revealed that "these Guidelines describe how the agencies analyze a range of non-horizontal transactions."

90. VERTICAL MERGER GUIDELINES, *supra* note 18, at 11.

collusion occurs. In a market with highly homogeneous products or services, a vertical merger with a weak downstream firm is more likely to trigger tacit collusion. Thus, the antitrust agency should assume that such a vertical merger will bring more cost than benefit and the merger should be barred.

However, no version of the Vertical Merger Guidelines discusses either the relationships between the effect of the EDM and changes in the incentives for downstream collusion, or the homogeneity of the downstream firms' products or services exacerbating the harm of coordinated effects. Therefore, we recommend that the Vertical Merger Guidelines incorporate analysis of these concerns, especially in the section on the coordinated effect.

B. *Integrating the Economic Concepts into the Burden-Shifting Framework*

As we introduced earlier, once the antitrust agencies have sued the merging firms in federal court, that is, the antitrust agencies ascertain a strong belief that the vertical merger could cause downstream collusion and harm society, the federal court next uses the burden-shifting framework to analyze the vertical merger case. Thus, how our economic concepts in Part III blend into this framework is important to all antitrust practitioners.

In detail, the burden-shifting framework adopted in the *Baker Hughes* case can be separated into two steps of analysis. First the antitrust agencies must prove an anticompetitive effect exists, and second the merging firms must prove there is a procompetitive justification.[91]

To prove an anticompetitive effect, the merger guidelines (either horizontal or vertical) reveal that the foreclosure effect and the coordinated effect are the two main elements to be proved by the antitrust agencies. Since the foreclosure effect has been significantly researched by legal and economic scholars, we focus on blending our concepts into the coordinated effect. To be more specific, based on our model, the level of homogeneity of the final products and the ratio of saved transaction costs are the two key factors with which to analyze the societal impact of the downstream collusive behavior. More importantly, we have found that some instances of downstream collusive behavior affected by these two factors may not actually cause a negative impact on society.

To illustrate such an instance, let us revisit Panel B in Figures 1 and 2. They revealed the social welfare under four different scenarios with the varying homogeneity and saved transaction ratios. As we discussed earlier, the level of homogeneity of the final products and the magnitude

91. *See generally* United States v. Baker Hughes Inc., 908 F.2d 981 (D.C. Cir. 1990).

of the saved transaction ratio could affect the social welfare once the vertical merger succeeds or the downstream collusion is implemented. Specifically, in the scenario where antitrust agencies strongly believe that the vertical merger could cause downstream collusion, by comparison with the scenario where nothing happens (that is, no vertical merger, no downstream collusion in the graph), we can see that if the level of homogeneity of the final products is low enough (for instance, when $b < 0.2$) and the saved transaction ratio is high enough (for instance, when $\alpha > 2.00$), downstream collusion after the vertical merger succeeds may improve social welfare. That is, the benefits of the vertical merger with downstream-collusive behavior could outweigh the negative impact of the downstream collusion. This concept is useful for federal courts to consider when applying the burden-shifting framework because it provides insight as to when a vertical merger should raise concern, and it underscores what the government and the defendant must prove.

In other words, we argue that the burden-shifting framework must be updated as it pertains to vertical merger analysis. Principally, the antitrust agencies must provide more evidence in order to prove that both the potential vertical merger might cause downstream collusion and that its future harm to society is substantial. In keeping with our economic concepts, such a showing requires the antitrust agencies to prove two things to confirm the harm of downstream collusion. First, the level of homogeneity of the final products in the industry is high. Second, the vertical merger could not save a substantial amount of transaction costs.

Once the antitrust agencies successfully prove those two elements, the burden of proof shifts to the merging firms, which must provide evidence and explain why the level of homogeneity is low and the possible vertical merger could save substantial internal transaction costs, which would make the societal impact of downstream collusion trivial. The following Chart 1 summarizes the updated burden-shifting framework for possible downstream collusion in the vertical merger context.

Chart 1: Updated burden-shifting framework for considering downstream collusion in vertical mergers

Parties	Antitrust Agencies	Merging Firms
Burden of Proof	High homogeneity and low saved transaction cost ratio.	Low homogeneity and high saved transaction cost ratio.

C. *Critiques and Application of the Economic Concepts to the AT&T–Time Warner Merger Case*

We have discussed the theory of the harm of downstream collusion in the vertical merger context and the possible integration of our theory into

the merger guidelines and the burden-shifting framework in the previous sections. In this part, we will discuss, through our theory of harm and the updated framework, how the AT&T–Time Warner merger case should be analyzed. The reason we choose this case as an example to critique and apply our concepts and framework is that the FTC had not tried to challenge a vertical merger since 1977 until this case in 2019.[92] Furthermore, after the merging companies successfully persuaded the D.C. Circuit to allow this vertical merger, the DOJ and FTC released the 2020 revision of the Vertical Merger Guidelines.[93] We cannot with certainty assert that the AT&T–Time Warner merger case caused changes in the Vertical Merger Guidelines, but the proceedings in that case may be related to those changes. Therefore, this case is the most relevant to explaining the applicability of our concepts and framework.

1. Brief Introduction of the Case and the Trial

AT&T proposed to merge with Time Warner on October 22, 2016. The purchase price was a total equity value of $85.4 billion and a total transaction value of $108.7 billion.[94] After several months of negotiation between the antitrust agencies and the merging firms, the FTC finally sued the merging firms for alleged violations of Section 7 of the Clayton in November 2017.[95]

In the trial, the FTC hired Professor Shapiro as the expert witness, and he used Nash bargaining theory to establish his arguments. Specifically, he argued that based on the Nash bargaining theory and quantitative model, if AT&T merged with Time Warner, the competitors of AT&T would be foreclosed from using Time Warner's content.[96] The reason behind this argument is that Time Warner's content is important to most of the downstream distributors.[97] Because of its importance, Time Warner could increase its leverage through merger and raise the license fees for AT&T's competitors.[98] If the license fees went too high, those downstream distributors might have difficulty paying those fees and

92. Victor Glass, *Culture Clash and the Failure of the AT&T/Time Warner Merger*, 6 RUTGERS BUS. REV. 350, 355 (2021).

93. *DOJ and FTC Announce Draft Vertical Merger Guidelines for Public Comment*, U.S. DEP'T OF JUST. (Jan. 10, 2020), https://www.justice.gov/opa/pr/doj-and-ftc-announce-draft-vertical-merger-guidelines-public-comment [https://perma.cc/Q2UY-AUMZ] (last visited May 9, 2022).

94. *AT&T to Acquire Time Warner*, AT&T (Oct. 22, 2016), https://about.att.com/story/att_to_acquire_time_warner.html [https://perma.cc/R78B-HCNM] (last visited May 9, 2022).

95. Complaint at 2, United States v. AT&T, Inc., 310 F. Supp. 3d 161 (D.D.C. 2018) (No. 17-2511).

96. United States v. AT&T, Inc., 310 F. Supp. 3d 161, 201 (D.D.C. 2018).

97. *Id.* at 210.

98. *Id.*

struggle to survive.[99] In the long run, those AT&T competitors could be "blacked out" because of the difficulty of surviving.[100] Even if the AT&T–Time Warner merger could cause some effects of EDM, Professor Shapiro still argued that the effect could not alleviate the possible blackout outcome because the consumers' loss due to the blackout outweighs the effect of EDM.[101]

The merging firms defended themselves by adopting Professor Dennis Carlton's regression analysis and proved that content prices had not been affected by previous instances of vertical mergers.[102] Moreover, Professor Carlton argued that Professor Shapiro's model overestimated the harm because he ignored the real-world effect of Turner Broadcasting's offer to arbitrate with almost 1,000 distributors.[103] Specifically, Turner Broadcasting agreed that distributors had the right to continue carrying Turner networks, subject to the same terms and conditions in the distributor's existing contract during the pendency of arbitration.[104] Professor Shapiro later acknowledged the omission of the arbitration agreement in his analysis.[105]

Finally, both Judge Leon in the district court and Judge Rogers, writing for a three-judge panel, in the D.C. Circuit agreed with the merging firms for the following reasons. First, the industry executives' evidence provided by the defendant is more probative.[106] Specifically, the merging firms provided analysis using real-world data such as prior instances of vertical mergers in the video programming and distribution industry.[107] For instance, the Comcast-NBCU merger should be considered in the analysis because both the Comcast-NBCU merger and the AT&T–Time Warner merger were vertical mergers in the video programming and distribution industry.[108]

On the other hand, Professor Shapiro's quantitative model was not supported by real-world evidence, especially because Professor Shapiro omitted the arbitration agreement as mentioned above.[109] More importantly, Section 7 of the Clayton Act is not restricted to quantitative evidence. Instead, both the price and non-price-related harm should be proved.[110] Second, Turner Broadcasting had no reason to raise the price

99. *Id.*
100. *Id.* at 172.
101. *Id.*
102. *Id.* at 180.
103. *Id.* at 184, 217.
104. *Id.* at 184.
105. *See id.* at 222–24.
106. *See id.* at 204.
107. *Id.* at 184.
108. *Id.* at 106.
109. United States v. AT&T, Inc., 916 F.3d 1029, 1039 (D.C. Cir. 2019).
110. *Id.* at 31–32.

of its content through the possible leverage of a blackout because the result of a blackout would also be very costly for Turner itself since a blackout could fail to secure higher license fees.[111] Furthermore, the arbitration agreement with the no-blackout guarantee is legally enforceable for both Turner Broadcasting and the distributors.[112]

2. Critiques of the Case

Based on the reasons above, we conclude there are three important flaws in the courts' merger analysis. First, both Judge Leon and Judge Rogers failed to specify how to analyze vertical merger cases, not to mention the possible harm of the downstream-collusion effect. As we saw in the case, several amici urged the D.C. Circuit to provide a proper legal standard for evaluating a vertical merger.[113] However, the judges still did not establish a specific standard. Instead, the judges just cited Section 7 of the Clayton Act and the burden-shifting framework in the *Baker Hughes* case for the analysis of all types of mergers.[114]

Furthermore, when investigating the analysis of the case, both judges only assessed which sides of the arguments were more persuasive. For instance, in the district court, Judge Leon only addressed the evidence provided by the third-party competitors, expert witnesses' testimony, and the government's expert testimony;[115] all these were insufficient to support the increased-leverage theory that Time Warner would raise the license fees for AT&T's competitors. Similarly, Judge Rogers in the D.C. Circuit only reiterated that the government's expert testimony from Professor Shapiro was flawed for insufficiently addressing real-world evidence, such as the long-term arbitration agreement, to support the argument that a blackout would occur.[116] Neither Judge Leon nor Judge Rogers addressed what specific legal standard they adopted to analyze the vertical merger case.

Second, even though the Vertical Merger Guidelines have not adopted the idea of the downstream-collusive effect, Judge Leon and Judge Rogers should not have avoided applying the unilateral and coordinated effects framework that is written in the Vertical Merger Guidelines. The Vertical Merger Guidelines are drafted by collecting different opinions of legal and economic experts and legal precedents.[117] Because of the

111. *Id.* at 24.
112. *Id.* at 23.
113. *Id.* at 15.
114. *Id.* at 5.
115. *See* United States v. AT&T, Inc., 310 F. Supp. 3d 161, 198–99 (D.D.C. 2018).
116. *See* United States v. AT&T, Inc., 916 F.3d 1029, 1038 (D.C. Cir. 2019).
117. Oliver E. Williamson, Address: The Merger Guidelines of the U.S. Department of Justice—In Perspective, https://www.justice.gov/archives/atr/merger-guidelines-us-department-justice-perspective [https://perma.cc/84YR-L6SY].

strong authority of the guidelines, judges should seriously consider whether the vertical guideline could be adopted as the analytical framework in each case. For instance, in the case of the Aetna-Humana horizontal merger, Judge Bates wrote, "[a]lthough the Supreme Court has never recognized the 'efficiencies' defense in a Section 7 case, the [D.C. Circuit] as well as the Horizontal Merger Guidelines recognize that, in some instances, efficiencies resulting from the merger may be considered in rebutting the government's prima facie case."[118]

According to the language of the previous sentence, we see that Judge Bates considered adopting the concepts in the Horizontal Merger Guidelines to analyze the Aetna-Humana horizontal merger. Thus, the importance of the merger guidelines to federal courts is obvious. However, both Judge Leon and Judge Rogers chose to ignore the Vertical Merger Guidelines and only addressed that "unlike [in] horizontal mergers, the government cannot use a short cut to establish a presumption of anticompetitive effect."[119] Instead, they should have adopted the framework in the Vertical Merger Guidelines to analyze the possible unilateral or coordinated effects on the industry and consumers.

Third, Judge Leon and Judge Rogers were over-reliant on the justification of the arbitration offered by Turner Broadcasting to almost 1,000 distributors. Specifically, Judge Leon and Rogers reasoned and reiterated that "[n]either the model nor Professor Shapiro's opinion accounted for the effect of the irrevocably-offered arbitration agreements, which the district court stated would have 'real world effects' on negotiations and characterized 'as extra icing on a cake already frosted.'"[120]

Although this evidence was not considered by Professor Shapiro in his quantitative model, one might also consider what would happen if this arbitration agreement was expired or unenforceable. That is, would Time Warner have raised the price of its content through the leverage of a blackout after the agreement had expired? Although many legal precedents favor a presumption of survival for the arbitration agreement,[121] this presumption is based on the mutual intention of the parties in the arbitration agreement.[122] Once one of the parties does not intend to proceed with the arbitral process, the arbitration agreement can

118. United States v. Aetna Inc., 240 F. Supp. 3d 1, 94 (D.D.C. 2017) (quoting FTC v. Sysco Corp., 113 F. Supp. 3d 1, 81 (D.D.C. 2015)).

119. AT&T, Inc., 916 F.3d at 1032.

120. *Id.* at 1038.

121. *See* Gollick v. Sycamore Creek Healthcare Grp., Inc., 260 A.3d 171, *4–5 (Pa. Super. Ct. 2021); Bossé v. N.Y. Life Ins. Co., 992 F.3d 20, 29–30 (1st Cir. 2021); Robinson v. Va. Coll. LLC, No. 2:19-cv-00064, 2019 WL 1903405, at *6 (N.D. Ala. Apr. 29, 2019).

122. *See* Patterson v. Am. Income Life Ins. Co., No. 4:19-cv-00918, 2020 WL 6387555, at *5–6 (E.D. Ark. Oct. 30, 2020).

be terminated.[123] The judges in this case only focused on the short-term effect of the arbitration agreement, and they ignored the possible long-term industry outcome if the agreement was terminated. That is, the judges should have seriously considered the possible harm of downstream collusion and the product homogeneity of the industry after the termination of the agreement.

3. Applying Our Economic Concepts to the Case

Based on our models and updated burden-shifting framework that account for downstream collusion, it is important to first explore the state of the content-distribution industry in the United States before we apply our concept to the AT&T–Time Warner case.

According to the memorandum opinion released by the federal district court, Judge Leon noted that the distribution of video content has three key players: (1) "traditional multichannel video programming distributors" (MVPDs), (2) "virtual MVPD," and (3) subscription video on demand (SVOD).[124]

The traditional MVPDs are direct broadcast satellite providers or cable television providers; "overbuilders," companies that provide facilities such as bundled telephone, cable television, and internet service delivered over their own fiber-optic local network; or "telcos," companies that provide telecommunications services such as fixed-line, mobile, and data services for end customers.[125] Specifically, firms running direct broadcast satellite service include DISH and AT&T's DirecTV. Cable television providers include Comcast, Charter Communication, and Cox Communications. "Overbuilders" include RCN Corporation, and finally, "telcos" include AT&T's U-verse and Verizon Fios.[126] From the perspective of consumer demand, approximately 90 million American households still received content through traditional MVPDs in 2017, but this number is declining because of virtual MVPDs and SVOD.[127]

The virtual MVPDs, unlike the traditional MVPDs, distribute linear channels and on-demand content to subscribers for a subscription fee.[128] Moreover, the contents or channels are delivered through the internet rather than through satellite networks or cable lines.[129] Thus, consumers will receive those contents or channels via the web and/or mobile apps.

123. Lizalde v. Vista Quality Mkts., 746 F.3d 222, 225 (5th Cir. 2014) ("Where one party has the unrestrained unilateral authority to terminate its obligation to arbitrate, however, the agreement understandably is illusory.").

124. United States v. AT&T Inc., 310 F. Supp. 3d 161, 169 (D.D.C. 2018).

125. *Id.* at 168.

126. *Id.* at 169.

127. *Id.* at 170.

128. *Id.* at 169.

129. *Id.* at 170.

Examples of virtual MVPD are DirecTV Now, DISH's Sling, Hulu Live, and Google's YouTube TV.[130] Based on the examples above, it is clear that some virtual MVPDs are also associated with the companies operating traditional MVPDs. Other virtual MVPDs are competing with the traditional MVPDs for subscribers.[131]

Finally, SVODs normally do not offer live, linear programming. Instead, they have large libraries of original or acquired content, which viewers can watch at any time.[132] SVODs, such as Netflix, Hulu, and Amazon Prime, also provide low-cost subscription plans, as opposed to traditional MVPDs. Similar to virtual MVPDs, SVODs also compete for subscribers with traditional MVPDs. Indeed, while traditional MVPDs are gradually losing subscribers, Netflix added 2 million subscribers in the first quarter of 2018.[133]

a. Antitrust Agencies: Proof of High Homogeneity and Low Saved Transaction Cost Ratio

To prove that the AT&T–Time Warner merger could lead to downstream collusion, antitrust agencies could first have investigated the level of homogeneity of the downstream content distributors. In detail, antitrust agencies should investigate the similarities of the products or services in the content distribution industry. To do the above analysis, antitrust agencies must further investigate the appropriate scope of the content-distribution industry so that its level of homogeneity can be adequately evaluated.

Based on the introduction of the content-distribution industry above, the antitrust agencies could have provided more evidence of the similarities of the services or products provided by those three players to prove that the level of homogeneity is high. Specifically, the antitrust agencies could have provided a detailed list of the contents that traditional MVPDs, virtual MVPDs, and SVODs have commonly licensed from the upstream content providers. For instance, AT&T operated traditional MVPD and virtual MVPD businesses, and they normally had to license content from Time Warner. Netflix, an SVOD, also acquired similar content from Time Warner. From the consumers' perspective, it is possible that they might be subscribed to services with similar content. If the antitrust agencies desired to prove that downstream collusion between AT&T and Netflix or other SVODs was possible, they could have provided more evidence of the homogeneity of the contents being licensed to AT&T and Netflix.

130. *Id.*
131. *Id.*
132. *Id.* at 175–76.
133. *Id.* at 170.

Finally, to prove the possible harm of downstream collusion, the antitrust agencies also needed to provide evidence of low saved transaction costs. AT&T might have colluded with its competitors following its successful merger with Time Warner. In detail, antitrust agencies should compare the marginal cost that AT&T needs to bear before the merger with its expected increase in profits because of the saved marginal cost after the merger.

One important thing that should be added to the analysis is evidence of causation between the saved pre-merger cost and the post-merger profits. The reason it is so important is that the post-merger profits might be achieved without the vertical merger.[134] For instance, if Time Warner had a long-term contract with AT&T about licensing the content and the license fees were much lower than those of other programmers, it is possible that AT&T could still make profits through this contractual scheme. Thus, applying our concepts to the AT&T–Time Warner Case, the antitrust agencies must prove two things: (1) the AT&T–Time Warner merger could not specifically save the marginal cost, and (2) even if the merging firms could make profits, the AT&T–Time Warner merger was not the cause of the profitability.

b. Merging Firms: Proof of Low Homogeneity and High Saved Transaction Cost Ratio

Once the antitrust agencies successfully prove high homogeneity of the content distribution industry and a low saved transaction cost ratio in the AT&T–Time Warner merger, the merging firms could defend themselves by proving the diversity of the industry content and demand between the traditional MVPDs, virtual MVPDs, and SVODs. For instance, the traditional MVPD content is sometimes released once a week, while SVOD content are usually released all at once. Furthermore, the demand for the traditional MVPDs is declining while that for the SVODs is increasing. The evidence above could help the merging firms defend against the arguments of high homogeneity of the content distribution industry.

Again, in terms of the proof of the high saved transaction cost ratio, the merging firms should put their effort into defending the concerns of the causation described above. That is, if the AT&T–Time Warner merger succeeded, the merger could specifically save substantial marginal cost. More importantly, those savings would not just be reflected in the post-merger profitability, but in the price, quantity, and quality of the content that the integrated downstream firms provided to the consumer. For instance, AT&T could provide substantial evidence about how much more content it could provide and how much the price

134. Salop, *supra* note 52, at 20.

would decrease for consumers as a result of its merger with Time Warner. Furthermore, AT&T could provide evidence about how many different types of movies (e.g., action or comedy) it would acquire after merging with Time Warner so that more consumer demands could be met.

CONCLUSION

The analysis of the downstream-collusive effect in the vertical merger context is not just a gap in the legal and economic literature but also an omission in the practice of the antitrust agencies. This Article provides a theory of the harm of the downstream-collusive effect in the vertical merger context and how the concept could be integrated into the federal antitrust guidelines and burden-shifting framework. More importantly, this Article took the AT&T–Time Warner merger case as an example and demonstrated how our concepts could be implemented in a real case. Interestingly, during the writing of this Article, the FTC withdrew the 2020 Vertical Merger Guidelines in September 2021 because of unsound economic theories.[135] In the future, it is worth investigating whether our concepts or theories of harm could be adopted in the next version of the Vertical Merger Guidelines.

135. Press Release, FTC, Federal Trade Commission Withdraws Vertical Merger Guidelines and Commentary (Sept. 15, 2021), https://www.ftc.gov/news-events/news/press-releases/2021/09/federal-trade-commission-withdraws-vertical-merger-guidelines-commentary [https://perma.cc/J7A2-8DEL].