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A Retrospective Analysis of the AT&T/Time Warner Merger

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Abstract

This article provides a retrospective of a litigated vertical merger: the 2018 AT&T/Time Warner merger, which was challenged by the US Department of Justice, litigated, and permitted to proceed by the court. We describe and evaluate in detail the economic model used by the government's expert and then focus our empirical work on the accuracy of the predictions made by that model. We also discuss evidence related to the Comcast/NBC Universal merger, which involved the same theory of harm and was allowed to proceed with a remedy similar to the contractual commitment that AT&T/Time Warner unilaterally adopted. We conclude that the evidence from the time of trial showed the theory of harm to be weak and the specific empirical predictions made by the government's expert to be wrong. Postmerger evidence confirms that conclusion, as does new evidence from the earlier Comcast/NBC Universal merger.

1. Introduction

The importance of merger retrospectives as a way to assess competition policy is well recognized, and many have been published.¹ Yet few retrospectives—none that we are aware of for any recent merger—examine the accuracy of the predictions made by economic models used in the antitrust investigation, despite the substantial lessons that can be learned from such studies. Moreover, to date, published retrospectives have focused on mergers that were not litigated (such as cases that were cleared unconditionally or in which the regulator accepted a

The authors thank Thomas Hazlett, Ken Heyer, Daniel O'Brien, Sam Peltzman, Clifford Winston, and a referee for helpful comments. Carlton is also associated with Compass Lexecon.

¹ For example, "We also recommend increased retrospective study of the effects of decisions to challenge or not challenge specific transactions. Such empirical evidence, although difficult to gather, is critical to an informed and effective merger policy" (Garza et al. 2007, p. iii); see also Carlton (2009).

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remedy without litigating; for summaries, see Kwoka 2015). There are not many litigated mergers in which the merging parties prevailed, and we are not aware of published retrospectives of any recent instances, despite the fact that such studies could provide important lessons on what went wrong in the government's case or assess whether the government was right but the court got it wrong.²

In this article, we seek to fill these gaps by performing a retrospective analysis of an important recent merger case that the government lost and by focusing our attention on the accuracy of the predictions made by the economic model used by the government's expert. We focus on the 2018 AT&T/Time Warner merger, which was challenged by the US Department of Justice (DOJ), litigated, and permitted to proceed by the court (*United States v. AT&T Inc.*, No. 17-02511-RJL [D.D.C. June 12, 2018]).³ To the extent that data permit, we also discuss evidence related to the Comcast/NBC Universal (NBCU) merger, which involved the same theory of harm and was allowed to proceed with a remedy similar to the contractual commitment that AT&T/Time Warner unilaterally adopted to address the antitrust concerns.

The authors worked on behalf of AT&T in the AT&T/Time Warner matter, and Carlton testified at trial. Israel also worked on behalf of Comcast in the Comcast/NBCU matter. We recognize the natural inclination to dismiss scholarly work from an expert witness in a matter as potentially biased, but if others are to evaluate or provide in-depth scholarly research and commentary on antitrust matters, it is desirable to hear the views of expert witnesses who have devoted substantial time and effort to analyzing the matters and who have had access to the detailed and often confidential data. Carl Shapiro, the government's expert in the case, published a scholarly article with his own perspective on the case (see Shapiro 2021; see also Carlton, Israel, and Shampine 2019). We urge the reader to look at the evidence presented and judge the works on their merits. When opposing experts disagree, as they did here, it is helpful to ask why. Is it the assumed facts? The model? Both? We explain in detail the areas of disagreement, the bases for each set of assumptions, and the most recent available evidence. Where possible we use data from public sources or readily available industry research, and we provide our underlying code for the econometric analyses that we present. As to the publicly available trial testimony based on confidential data, we stress that analyses in litigation are scrutinized to a degree unusual in scholarly work, and, as indicated in this article, much of the empirical work we cite herein from the trial was reviewed by and not challenged by the government. Critically, both sets of empirical work that we discuss—the one based on public sources, which we update and present in more detail in this article, and the publicly available trial testimony based on confidential data—yield the same conclusion: a lack of sup-

² Such retrospectives may also be helpful with respect to the ongoing debate about the optimal degree of antitrust intervention (see, for example, Winston 2021).

³ Compass Lexecon worked on the mergers on behalf of AT&T/Time Warner and Comcast/NBC Universal (NBCU). Carlton served as the main economic expert for AT&T at the AT&T/Time Warner trial; henceforth, he is referred to as “the AT&T expert.” Carl Shapiro served as the government's main economic expert at trial; we refer to him as “the government expert.”

port for the harm to competition alleged by the government with regard to the AT&T/Time Warner matter.

Notably, the AT&T/Time Warner case was the first vertical merger case litigated to conclusion by the DOJ in the last 40 years (see, for example, Reardon and Sorrentino 2019), and, because it was litigated, the record contains specific detailed predictions that we can evaluate. By contrast, there is less information available about the Comcast/NBCU case.

The government model in the AT&T/Time Warner and Comcast/NBCU cases consists of two main parts: an upstream bilateral Nash bargaining model, sometimes referred to as a bargaining leverage over rivals (BLR) model, and a downstream merger simulation. The BLR model is used more frequently in antitrust analysis lately and has sparked controversy, which makes it particularly interesting to study (see, for example, Rogerson 2020a; Brief Amici Curiae of 37 Economists, Antitrust Scholars, and Former Government Antitrust Officials in Support of Appellees and Supporting Affirmance, *United States v. AT&T Inc.*, No. 18-5214 [D.C. Cir. September 26, 2018]; Brief for 27 Antitrust Scholars as Amici Curiae in Support of Neither Party, *United States v. AT&T Inc.*, No. 18-5214 [August 13, 2018]). Its logic also guides some of what was in the new (withdrawn by the Federal Trade Commission [FTC] but still in force at the DOJ) vertical merger guidelines, and the model was cited by commenters during the guideline review process (see Rogerson 2020a). Thus, it is important to see how the BLR model performs in practice, both alone and as a part of a larger merger simulation exercise.

There has also been substantial interest in recent years in vertical mergers generally, and in video distribution in particular, as can be seen by the extensive comments filed in FTC and DOJ hearings on vertical mergers and the vertical merger guidelines.⁴ The interest focuses heavily on a central question: Is there evidence of harm that would support claims that vertical mergers should be subject to more stringent scrutiny than they currently are, or do efficiencies from such mergers outweigh harms in most cases? Does the empirical evidence support theoretical claims of likely harm and increasing calls for more stringent antitrust scrutiny of vertical mergers?

Finally, this may be a particularly relevant time to examine the AT&T/Time Warner merger, as AT&T vertically disintegrated recently, separately spinning off DirecTV and Time Warner and creating a new media company by merging with Discovery (see, for example, Blumenthal 2021; Kovach and Meredith

⁴ See, for example, the extensive comments, many focused on video distribution, archived by the Federal Trade Commission (FTC) from the 2018 hearing on vertical merger analysis (FTC, Public Comment Topics and Process: Hearings on Competition and Consumer Protection in the 21st Century [<https://www.ftc.gov/enforcement-policy/hearings-competition-consumer-protection/public-comment-topics-process#initialtopics>]) and the review period set by the FTC and the Department of Justice (DOJ) for the new vertical merger guidelines (FTC, #798: Draft Vertical Merger Guidelines: Public Comments [<https://www.ftc.gov/policy/public-comments/draft-vertical-merger-guidelines>]).

2021).⁵ That the previous integration did not work out as AT&T hoped represents a firm's decision regarding what risks to take in the market, not an indication that the government's alleged harms came to pass. Indeed, the disintegration is evidence that the alleged harms, such as supracompetitive pricing or other exercises of market power, did not occur. The reasoning is straightforward: if the mergers had created significant market power as the government alleged, AT&T would have been incentivized to retain ownership, which would make the subsequent spinoffs less likely (see, for example, Hazlett 2021).

Throughout this retrospective, we compare and contrast the outcome of the AT&T/Time Warner merger with the Comcast/NBCU merger because of commonality in the theory of harm and in the approaches taken to address the alleged harm. The FCC and DOJ applied a very similar vertical model in the Comcast/NBCU merger as the DOJ applied in the AT&T/Time Warner merger, and it appears that concerns about harm to competition were greater in the Comcast/NBCU merger than in the AT&T/Time Warner merger (see, for example, Expert Report of Dennis W. Carlton [redacted], sec. 5.D, *United States v. AT&T Inc.* [February 2, 2018]). However, the Comcast/NBCU merger was allowed to proceed with remedies under a government-monitored consent decree. The government declined to offer the same remedies in the AT&T/Time Warner merger, but the merging parties unilaterally instituted a similar remedy to the antitrust concerns, as a self-enforcing private contract between AT&T and current and future customers of Warner Media's Turner networks. Thus, one cannot have a serious discussion about the two cases without discussing remedies. Indeed, the obvious questions are whether the remedies were effective in either case and, more generally, whether the mergers, with remedies, were harmful to competition and consumers. In this vein, we also examine the evidence as to whether private contracts with arbitration appear to be able to solve antitrust problems—by asking whether the unilateral commitment in the AT&T/Time Warner merger functioned as well as the government-overseen consent decree in the Comcast/NBCU merger—and whether such remedies should be characterized as structural or behavioral remedies.

We begin in Section 2 with a brief review of how vertical mergers differ from horizontal mergers and why they are gaining increased antitrust attention. We then describe in Section 3 the model applied by the government in the Comcast/NBCU and AT&T/Time Warner mergers and the predictions made in each case. For the AT&T/Time Warner litigation, we also describe how disputes over assumed parameter values in the model affected the price predictions—not just in magnitude but in the sign of the predicted effects—and how concerns over modeling assumptions affected its credibility. We then explain in Section 4 what retrospective tests of the effects of the mergers, with remedies in place, are available.

⁵ While AT&T shareholders retained an ownership interest (at least initially) in DirecTV and Warner Bros. Discovery, the companies are now separate entities, and so it is no longer the case that the setting of content prices is subject to the same economic incentives as alleged by the government's theory of the case.

In Section 5 we examine the available evidence to evaluate which, if any, predictions came true and, more generally in Section 6, what can be learned from these recent cases about vertical mergers in video distribution, particularly those that include arbitration remedies. The evidence indicates that the forward-looking assumed parameter values used by the government in the AT&T/Time Warner case were incorrect, that the model would not have predicted harm had more realistic parameter values been used, and that the more realistic parameter values were consistent with what the AT&T's expert used. In any event, the evidence indicates that the harm predicted by the government's expert in the AT&T/Time Warner case did not occur and that the decision of AT&T to spin off Time Warner provides confirmatory evidence of the invalidity of the government's prediction of harm. Our overall conclusions are that the government's vertical theories of harm were not applicable in the AT&T case, it was a mistake to bring the case, and while AT&T might have been mistaken in believing the merger would be financially successful, it is not the job of the government to prevent firms from taking risky business decisions that do not harm competition.

2. Antitrust Approach to Vertical and Horizontal Mergers

Traditionally, antitrust enforcers and regulators have been less concerned about vertical mergers than about horizontal mergers. It is worth taking a moment to consider why. First, horizontal mergers, by definition, eliminate a competitor; for this reason, there is an inherent economic concern that those mergers may reduce competition. By contrast, in a vertical merger, every level of the vertical chain retains its competitors, and there is no necessary increase in market concentration at any level of the chain. Second, and closely related, the set of assets that come under control of a single owner in a vertical merger are complements, not substitutes. This fundamentally changes the economic analysis—for example, the inherent pricing pressure created by the merger of complements is downward, not upward as in mergers of substitutes—and helps explain empirical findings showing that vertical mergers are generally beneficial to competition and consumers. That is, a horizontal merger has the potential to create a distortion (akin to imposition of a tax) in the product market, while a vertical merger has the potential to remove a distortion (akin to removing a tax) on an input and to increase a distortion to downstream rivals; we discuss both below.

To be clear, horizontal and vertical mergers can, in some circumstances, harm competition, but the concerns are different. A key concern in a horizontal merger is that the two divisions of the combined firm (which were previously separate firms) will internalize the constraints that more aggressive competition has placed on one another, which thereby softens competition and leads to higher prices. In a vertical merger, there can be a concern that the vertically integrated firm will leverage the market power that one division of the combined firm possesses to create or increase market power for the other division.

There has been increasing focus on power leveraging in recent years, which led

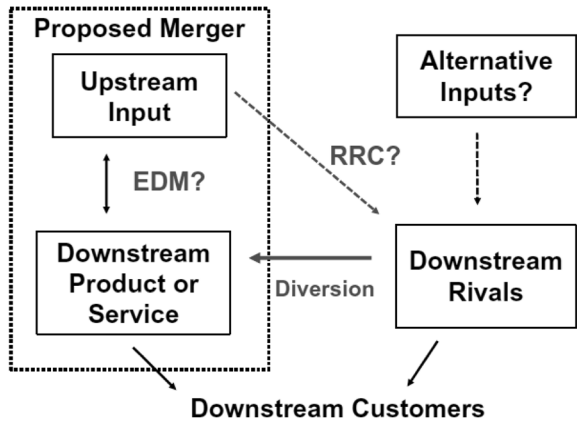


Figure 1. Elements of raising rivals' costs analysis (Shapiro 2021, figure 1)

to the issuance of new vertical merger guidelines (US Department of Justice and the Federal Trade Commission 2020) to address the possibility of raising rivals' costs, a specific version of such a leveraging theory. The basic elements of the benefits and harms from a vertical merger involving a raising rivals' costs theory of harm are sketched in Figure 1.⁶

As Figure 1 makes clear, vertical integration can both produce benefits (for example, eliminate double marginalization [EDM], which is an illustration of the Cournot complements result that mergers of complements create downward pricing pressure) and raise concerns about raising rivals' costs (RRC) (which can create upward pricing pressure). The benefits to competition work through the internalization of incentives. When two firms, each of which has some ability to set prices above marginal costs, offer complementary products (like video content and video distribution), lowering prices or making investments to improve one of the complementary products can benefit both of the firms and consumers as well. For example, if one firm produces distinctive cars and the other makes customized engines, then as the engine becomes better, the overall car becomes better. Both the car manufacturer and the engine manufacturer make more sales. When the companies are separate, however, neither firm receives all of the benefits from lower prices or increased investments; instead, some benefits spill over to the other firm. A vertical merger brings the benefits to both firms under one roof, which increases the incentives to lower prices or make investments since the combined firm considers (internalizes) the full set of benefits when making investment decisions.

⁶ For a general discussion of potential vertical concerns, see Salop and Scheffman (1983). For a more recent discussion of vertical mergers, see Carlton (2020). For an application of the theory using Nash bargaining to the AT&T/Time Warner case, see Shapiro (2021).

The possible harm to competition from a vertical merger is less obvious than the harm from a horizontal merger, but it can occur in some settings. If the integrated firm raises the upstream input price to downstream rivals, the integrated firm will make less money from selling the input to them than before the merger (since it was presumably setting the premerger price to maximize its profits from the sale on the input), but there is an offsetting benefit to the firm since the sales of the integrated firm's downstream product can increase because it now faces a weaker (higher-cost) downstream competitor. That is, sales of the input by the upstream firm to a rival of the downstream firm create an externality that impacts the downstream firm. With vertical integration, the input provider internalizes this externality, and that can create an incentive for the upstream firm to raise the input price to rival downstream firms, which results in upward pressure on downstream prices.

Given that there are (at least) two offsetting effects of a vertical merger, one needs to use some economic model to predict the net effect of the interactions of these two effects.⁷ That is what the recent literature tries to do with various models that combine the incentive to gain efficiencies, which leads to downward pricing pressure, with the incentive to raise rivals' costs, which leads to upward pricing pressure. (Indeed, this is what the government expert in the AT&T/Time Warner merger case attempted to do.)

There has been substantial empirical work on the efficiency effects of vertical integration. For example, a widely cited survey of the economic literature concludes, "As to what the data reveal in relation to public policy, we did not have a particular conclusion in mind when we began to collect the evidence, and we have tried to be fair in presenting the empirical regularities. We are therefore somewhat surprised at what the weight of the evidence is telling us. It says that, under most circumstances, profit-maximizing vertical-integration decisions are efficient, not just from the firms' but also from the consumers' points of view. Although there are isolated studies that contradict this claim, the vast majority support it" (Lafontaine and Slade 2007, p. 680).

Beck and Scott Morton (2021) revisit and update that survey, emphasizing that while efficiencies are present, concerns can also arise. The authors state that of seven older panel studies, two found evidence of harm from vertical integration, and five found evidence of benefits. Of 29 more recent studies, six found no effect, five found evidence of both harm and benefits, nine found evidence only

⁷ There is a separate question about whether the effects are merger specific. Merger specificity is commonly discussed with respect to efficiencies. For example, if absent the merger the separate firms would achieve an efficiency through contract, the efficiency is not merger specific. But exactly the same reasoning applies to the potential harms from the vertical merger. If absent the merger the harm would be achieved through contract, then the harm is not merger specific. For this reason, in vertical cases (unlike horizontal cases in which such contracts that harm competition are likely detectable and per se illegal) it is appropriate to question merger specificity for both alleged harms and benefits.

of harm, and nine found evidence only of benefits.⁸ The authors conclude, “[I]n our view the economic literature demonstrates a variety of effects of vertical integration, including foreclosure and efficiencies, that justify examining vertical transactions on their merits rather than making general assumptions about their competitive effects” (Beck and Scott Morton 2021, p. 274). However, Slade (2021) expresses a more positive view of the benefits from vertical integration. Lafontaine and Slade (2021) and Beck and Scott Morton (2021) question whether there should be a general presumption regarding the effect of vertical mergers. Moreover, many airline and railroad mergers have vertical elements, and there are retrospectives focusing on those industries with many (but not all) finding procompetitive results.⁹

Recent empirical work on this topic includes Luco and Marshall (2020) and Hosken and Taylor (2022). Luco and Marshall (2020) study vertical integration in the beverage industry and examine firms with multiple substitutable products, only some of which are distributed by vertically integrated firms. They find that prices for the vertically integrated products fall by around 1 percent, while prices for the nonvertically integrated products rise by around 1 percent as the vertically integrated firm seeks to steer sales to the vertically integrated products (Luco and Marshall 2020, p. 2055). Hosken and Taylor (2022, p. 461) study gasoline retailing using a similar methodology and find that “[t]he net effect of vertical separation on retail gasoline prices was essentially 0.”

A reasonable conclusion, in our view, is that vertical integration likely raises fewer competitive problems than horizontal ones—which has led to the empirical finding of benefits or no harm in many cases—but that it is possible for vertical mergers to harm consumers, particularly when they relax constraints that were preventing one of the merging firms from maximizing profits or permit leveraging of market power from one market into another. Although information from other studies on vertical integration provides useful background, each case should be analyzed on its own facts. For example, in the AT&T/Time Warner merger, the government recognized certain benefits of vertical integration but also certain potential harms, and we agree with the government that their relative importance should be evaluated on the basis of the facts of the case.

⁸ One study reviewed in Beck and Scott Morton (2021) is the retrospective of the DirecTV and Fox vertical integration in Baker et al. (2011), which claims to find evidence of harm but no benefits as a result of the integration. However, as part of his analysis of the AT&T/Time Warner transaction, the AT&T expert analyzed the effects of vertical integration between DirecTV and Fox and found no evidence of a price increase associated with vertical integration (see Rebuttal Expert Report of Dennis W. Carlton [redacted], para. 24, *United States v. AT&T Inc.* [February 26, 2018]). Baker et al. (2011) does not provide sufficient detail about the data and estimation methods used to allow reconciling these contradictory findings. In any event, the DirecTV/Fox transaction predates very significant industry developments such as streaming and cord-cutting and is therefore of limited relevance.

⁹ For example, Winston, Maheshri, and Dennis (2011) conclude that despite antitrust concerns, the studied railroad mergers had negligible effects on consumer welfare; Carlton et al. (2019) find that the recent legacy airline mergers were procompetitive.

3. The Government's Model

In this section we explain the government's model, discuss disputed assumptions underlying the theory and parameter values, and go over the various predictions based on different assumptions. In general, this is a complicated model, the predictions of which are sensitive to the assumptions. Given the complexity, it is important to assess whether the assumptions and resulting predictions can be empirically confirmed.¹⁰ We discuss available retrospective evidence in the following sections.

3.1. Theory

We turn now to a summary of the government's model in the Comcast/NBCU and AT&T/Time Warner mergers. The government's model in each case consists of two parts—an upstream bargaining model that determines the price of the input to rival distributors and a downstream merger simulation that determines the prices of the retail products given the outcome of the bargaining model (see Expert Report of Carl Shapiro [redacted], pp. 39–58, *United States v. AT&T Inc.* [February 2, 2018]; for a discussion of the Comcast/NBCU model, see Rogerson [2014]).

For the bargaining model, the basic premise is that a content creator negotiates with each distributor over the price of the content, holding all other entities' prices constant. That is, the model treats bargaining between the content creator and each distributor as a simultaneous game, which ignores any of the linkages between the outcome of one negotiation and all future negotiations, an assumption that is critical and also likely incorrect in this industry, as we discuss more below.¹¹ The parties split the joint profits from reaching a deal (the gains from trade) according to their relative strengths in a Nash bargaining model. The outcome of the negotiation depends importantly on the threat points—what happens to each party if they fail to reach an agreement. In the case of a television network and a video distributor such as a cable company, the model assumes that failure to reach an agreement means that the cable company does not broadcast the network—a blackout.¹²

In the cases at hand, the content at issue is the NBCU networks (both cable and

¹⁰ We recognize that some believe that complicated models are too unreliable to be defensible in litigation and that whoever must rely on them to meet their burden of proof will fail. As we discuss later, our view is that complicated models can provide valuable information but likely work best when they have some track record of success in making predictions and are presented in conjunction with other evidence.

¹¹ That is, an important assumption of the model is that the content provider is unable to commit to content prices unilaterally and instead negotiates bilaterally with each distributor of content, not recognizing the impact that its negotiation has on the other negotiations and contracts in which it is involved, even if, as is not uncommon, there is a most-favored-nation clause that guarantees that the content price term in one negotiation will contractually alter the price in other contracts.

¹² To be clear, the model refers to a hypothetical permanent blackout, not a temporary one, as the relevant threat point, although observation of temporary blackouts may be informative for estimating some assumed values in the model. See, for example, Expert Report of Carl Shapiro, which discusses how information from temporary blackouts can be used to calibrate the model.

broadcast) and the Turner (Time Warner) networks (cable only). The distributors at issue are multichannel video-programming distributors (MVPDs) such as cable companies and direct-broadcast satellite companies.¹³

The government's upstream bargaining model focuses on the change in pricing incentives that arises when a content provider merges vertically with a distributor of its content. According to the model, if the parties fail to reach an agreement, the content provider's threat point improves from the premerger situation because the distributor, lacking the content, will lose some subscribers, who will move to the vertically integrated content provider's distribution arm. Thus, unlike in the premerger situation, the pain suffered by the content provider from not striking a deal with certain distributors is less. Under the model, this improvement in the content provider's threat point will, all else equal, result in the licensing distributor paying a higher price for the content. The upstream bargaining model does not explicitly take into account that any increase in the input price will affect downstream prices. The government expert used Figures 2 and 3 to explain the model. The boundaries are the threat points (for more details, see the Appendix).

The predicted content price increase in the government model is roughly the bargaining split times the incremental profit to the vertically integrated distributor if the rival distributor does not carry the content. Another way to think of this price increase is that after integration the economic (opportunity) cost of selling to a downstream rival distributor rises to reflect that such a sale deprives the vertically integrated firm of its own downstream sales. As a result, the price the vertically integrated firm charges the downstream rival has upward pricing pressure. So, in the AT&T case, the concern was that AT&T would raise the price of, say, TNT to Comcast, to reflect the opportunity cost to DirecTV (owned by AT&T) from licensing content to Comcast, which can take sales away from DirecTV. Hence, the key parameter values for determining the size of the predicted content price increase are the bargaining split (what fraction of the gains from trade the content provider gets, as determined by the relative bargaining strengths of the content provider and distributor), the departure rate (what fraction of subscribers the distributor will lose if it does not carry the content), the diversion rate (what fraction of the lost subscribers will go to the vertically integrated distributor), and the profit margins from a sale upstream and downstream at the vertically integrated distributor (which affect the potential gains and losses to the merged firm if a rival distributor does not carry the content).

As noted above, this Nash bargaining concept—and bilateral bargaining generally—assumes that the negotiations of each MVPD and content provider are unrelated (have no effect on one another) so that a Nash equilibrium assumption—holding all input and output prices other than those at issue in the nego-

¹³ The government expert did not apply his model to HBO, which is sold as a stand-alone product, and did not claim that there would be price increases or withholding of HBO.

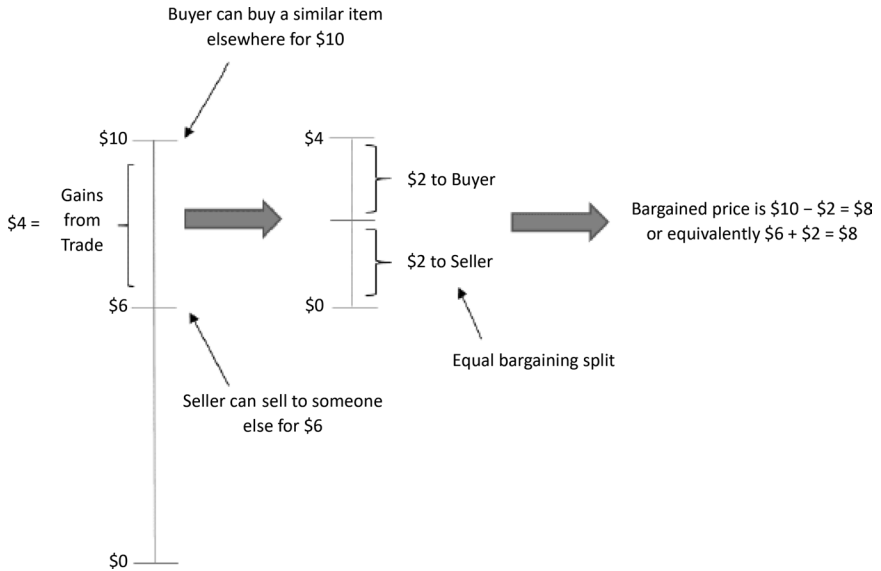


Figure 2. The Nash bargaining solution for price (Expert Report of Carl Shapiro [redacted], *United States v. AT&T Inc.*, figure 8 [February 2, 2018]).

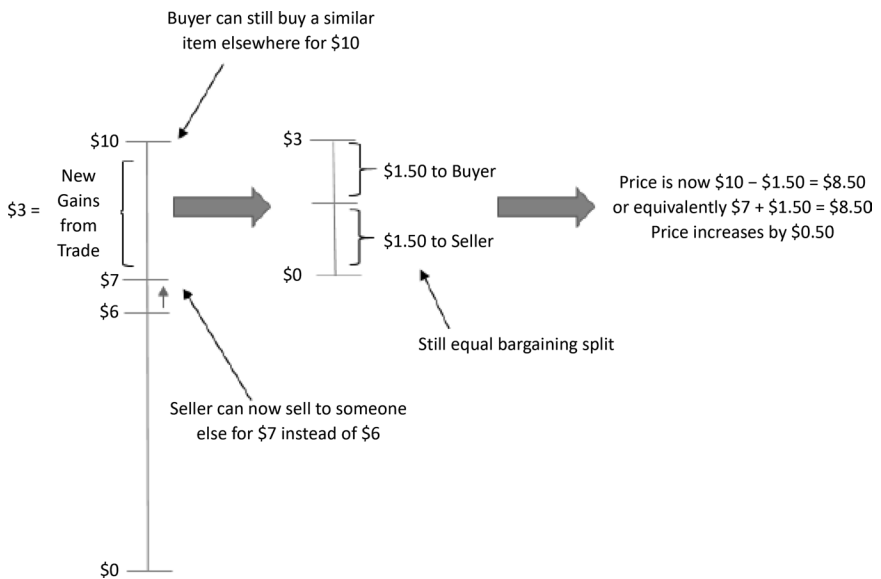


Figure 3. An increase in the seller's minimum price causes the negotiated price to rise (Expert Report of Carl Shapiro [redacted], *United States v. AT&T Inc.*, figure 9 [February 2, 2018]).

tiation fixed—can be made.¹⁴ Moreover, there is no concern about the effect of failing to reach agreement on subsequent negotiations with existing partners (because the negotiations are modeled as simultaneous). So, for example, if Comcast loses sports programming on TBS, then there is no consideration given to the fact that Comcast might face future higher prices from sports channels that recognize that Comcast does not have access to TBS. If this assumption is wrong, then the entire model can fall apart. For example, if before a merger the content provider is managing to set terms such that overall industry profits are maximized (perhaps through application of most-favored-nation agreements linking the negotiations), then the theory of harm would not apply, as the fully vertically integrated outcome would be obtained before a merger.

The second stage of the overall model consists of inserting the price changes for content predicted by the bargaining model into a merger simulation (generally using a logit demand system, although other demand systems could be used) and solving for equilibrium prices set by the various MVPDs (for details, see Expert Report of Carl Shapiro, app. L). Benefits from the elimination of double marginalization are reflected at this stage. Because the model incorporates both the possibility of increased content costs of other MVPDs (potentially pushing retail prices upward) and the possibility of lowered content costs of the vertically integrated MVPD (potentially pushing retail prices downward), the direction of the merger's effect on average retail prices, and on consumer welfare, is ambiguous as a matter of economic theory but depends on the modeling assumptions and parameter values. A key undisputed point is that, although the mechanism for harm is raising content prices to rivals, it is the overall retail pricing to consumers that matters, since one needs to take account of the desirable effects of creating efficiencies from vertical integration alongside the harmful effects from raising costs to determine the merger's all-in effect.

The government's implementation of the model in the Comcast/NBCU and AT&T/Time Warner mergers treated the two stages (upstream bargaining and downstream competition) as independent. This assumption simplifies the implementation of the model, but it also ignores effects that may be important because

¹⁴ A general difficulty with these sorts of models is that estimating or simulating the parties' reactions, and consumers' and/or competitors' reactions in turn, is challenging and is typically ignored. For example, Crawford et al. (2018) assume that none of the factors change, including the controversial assumption that the multichannel video-programming distributor (MVPD) that loses content does not change its own prices in response. This assumes away across-the-board price cuts and targeted promotional efforts. This is also a critical assumption with respect to competitive effects. Does losing content hurt an MVPD's margins per subscriber or number of subscribers? Only the latter creates an adverse vertical merger effect under the usual bargaining theory. However, MVPDs have an incentive to commit to taking the loss through margins (for example, to guarantee price cuts if content is lost) because that does not generate the diversion and recapture by the merged firm's downstream (MVPD) division. That is, this strategy removes or reduces the vertically integrated MVPD's ability to use blackouts to drive departures to it and thus takes away or mitigates any leverage effect. This strategy is a realistic one. For example, YouTube TV announced that if it did not reach a deal with NBCU and hence stopped carrying the NBCU networks, YouTube TV would reduce the price of its service to consumers by \$10 (YouTube Team 2021). Altering the allowed responses of the parties in the model can thus profoundly change the predicted competitive effects.

the stages are not, in fact, independent. The input price and the elimination of double-marginalization efficiencies affect the downstream prices, and thus the profit margins, which in turn should affect the equilibrium content prices, but they do not in the government's implementation of the model. Rogerson (2020b, p. 428) states that "[s]ince the equilibrium feedback effects can be complex it is difficult to say how the Department of Justice's estimate of the consumer harm generated by the merger would have changed had it used the fully correct procedure." The end results of treating the two stages as independent are that any vertical merger will produce an increase in prices charged for content to rival MVPDs regardless of the magnitude of the benefits of the elimination of double marginalization and that the downstream prices used in the bargaining model differ from the downstream prices that emerge from the simulation model. Rogerson (2020b, p. 426) further notes that the literature indicates that a model's predictions (including the effects of treating the stages as independent) can be highly sensitive to "relatively arbitrary functional form assumptions for demand."¹⁵

During the Comcast/NBCU and AT&T/Time Warner cases, concerns, including those mentioned above, were raised about whether the government's models accurately reflect the video content and distribution negotiations.¹⁶ We return to those concerns and their implications for retrospective analyses after describing the predictions made by the various parties in each merger.

3.2. *The Government's Base Price Predictions*

The government made predictions with regard to content and retail prices in both mergers, but only those in the AT&T/Time Warner case are publicly available. However, Rogerson (2014) attempts to estimate the upstream content price predictions (although not the retail price predictions) for the Comcast/NBCU case. Rogerson (2014, pp. 546–50, 555) estimates that the government's predictions for content price increases to the NBCU cable networks (the relevant comparable for the Time Warner cable networks) would be at least 9 percent, based on an assumed 5 percent departure rate, but also notes that the government likely assumed a substantially higher departure rate, perhaps closer to 25 percent.¹⁷ At

¹⁵ Rogerson (2020b, p. 426) specifies that "papers collectively show that the net welfare impact of a vertical merger can be positive or negative and that the results hinge sensitively on the specific functional form assumption on demand. Thus, while they clearly support the conclusion that the [elimination of the double-marginalization] effect cannot simply be ignored and must be taken into account along with the [raising rivals' costs] and/or [bargaining leverage over rivals'] effects . . . , they also provide support for the concern that the results of simulations may depend on relatively arbitrary functional form assumptions for demand."

¹⁶ For example, in addition to concerns already noted, prices are typically negotiated for years in advance, which delays any adverse pricing effects. In addition, distributors may have most-favored-nation guarantees, such that negotiations are subject to additional restrictions and are not independent of one another, which destroys the Nash assumption (see, for example, Rebuttal Expert Report of Dennis W. Carlton, pp. 28–31).

¹⁷ None of the estimates in Rogerson (2014) appear to factor in the remedies implemented in the Comcast/NBCU transaction.

the latter departure level, the predicted content price increases for the NBCU cable networks would be closer to 45 percent.

For the AT&T/Time Warner merger, the government estimated that the prices per subscriber per month for the Turner networks would increase for rival MVPDs by an average of \$.76, or 16.2 percent (Expert Report of Carl Shapiro, figure 13). While the government predicted different retail price effects for each MVPD (and for different regions for a given MVPD), we focus on the overall average effects reported by the government. The government predicted that DirecTV's average retail prices would fall by \$.26 and that other MVPDs' prices would, on average, rise between \$.22 and \$.60, for an overall average retail price increase of about \$.27 per subscriber per month (Expert Report of Carl Shapiro, figure 15).¹⁸ The \$.27 figure is roughly .19 percent of a typical MVPD subscriber bill of around \$140 per month (Rebuttal Expert Report of Dennis W. Carlton, para. 5). Thus, the prediction was that DirecTV retail prices would be about .2 percent lower but that overall average MVPD retail prices would be about .2 percent higher.¹⁹ (Again, it is overall final retail prices, not content prices, that one needs to look at to determine on net whether there is consumer harm.)

All of these predicted price changes are measured relative to the but-for world in which no merger occurs. Both content and retail prices had been trending higher prior to the merger. For example, the government expert reported that per-subscriber content costs grew roughly 90 percent between 2009 and 2016, and retail video average revenue per user (ARPU) grew roughly 75 percent over the same period (see, for example, Expert Report of Carl Shapiro, figures 4 and 6). Thus, a predicted price decrease is relative to that trend of increases and does not imply an absolute reduction in the level of prices in the future—only a lower price level than would have occurred absent the merger. It is also worth noting that the government expert provided no statistical estimates of the standard errors of the predicted price increases, and so one could not determine the statistical confidence that should be placed on the government's predictions.

3.3. *The Model's Assumptions and Predictions of Content and Retail Prices*

As noted above, the key parameter value assumptions that feed into the bargaining model are the bargaining split, the departure rate, the diversion rate, and the profit margins on the upstream and downstream subsidiaries of the merged firm. There were disputes in both merger cases about those assumptions and hence about the price predictions made by the model.

In the Comcast/NBCU merger, the details are not public, although Rogerson

¹⁸ In 20.6 percent of geographic zones, accounting for 2.3 percent of Turner subscribers, the predicted net effect on retail pricing would be 0 or negative (Expert Report of Carl Shapiro, figure 17). Note that this is a prediction holding all else constant, and so it ought to be measured relative to trend. Both content and retail prices had been trending higher prior to the merger.

¹⁹ The government argued that while a .2 percent price increase may sound small, it would impact enough consumers to total roughly \$24 million per month (Expert Report of Carl Shapiro, figure 15).

(2014, pp. 543–53) suggests that alternative parameter value assumptions were suggested by the merging parties that would have produced lower or no predicted retail price increases. In the AT&T/Time Warner merger, the assumed parameter values for bargaining split, departure rate, diversion rate, and profit margin were all intensely disputed.

With respect to profit margins, the government expert used AT&T (DirecTV) margins from early 2016 and predicted that they would remain constant going forward. In contrast, the AT&T expert observed that AT&T's margins had declined each year since 2012 and that third-party analysts predicted that they would continue to decline. The most recent margins available at the time of the trial were from June 2017 and were lower by 39 percent than the early 2016 margins used by the government expert. Using the most recent margins available as of the trial and conservatively assuming that they would remain constant going forward reduced the estimated adverse net retail price effect from \$.27 to \$.05 (roughly .04 percent on a consumer's average monthly bill of \$140) (Rebuttal Expert Report of Dennis W. Carlton, paras. 45–46).²⁰ The AT&T expert explained that his assumed parameter value was conservative (that is, favorable to the government) because, given the existing trend, margins were likely to continue to decline (see Trial Test. of Dennis W. Carlton, pp. 2448–49, *United States v. AT&T Inc.* [April 12, 2018]). A further decline in AT&T's distributor margins would reduce any predicted content or retail price increases in the government's model.

With respect to the diversion rate, the government model assumed diversion proportional to then-current subscriber shares.²¹ The government expert assumed that the outside good—cord-cutting—would have a roughly 10 percent share, based on the same survey that he relied on for the departure rate, which, as discussed below, the court found not to be credible. The AT&T expert explained that the government expert also assumed that cord-cutting would decline in importance, whereas the AT&T expert's opinion (credited by the district court) was that cord-cutters would likely grow in importance (Trial Test. of Dennis W. Carlton, p. 2448; Expert Report of Carl Shapiro, n. 241; Rebuttal Expert Report of Dennis W. Carlton, para. 69; Richard J. Leon, Memorandum Opinion, *United States v. AT&T Inc.*, pp. 137–41 [June 12, 2018]).²² The AT&T expert also pointed out the internal inconsistency in the government expert's approach of using the number of subscribers to MVPDs to estimate the likelihood of diversion but not using the number of cord-cutters to do the same (Rebuttal Expert Report of Dennis W. Carlton, para. 70). Cord-cutters accounted for roughly 20 percent of

²⁰ The government expert inexplicably continued to rely on the older numbers even after he became aware of the more recent ones.

²¹ Shapiro (2021, p. 317) criticizes as uninformative the AT&T expert's reference to Turner's 6.4 percent share of viewership. Shares can be a crude measure even in horizontal cases, and more so in vertical cases, but can still be of value in screening out frivolous cases. Nonetheless, the share was not part of the model's assumptions nor of the AT&T expert's criticisms of the model.

²² The court also noted that the survey firm had altered the survey's results and without explanation reduced the reported cord-cutting estimate by 40 percent, which cast further doubt on its credibility.

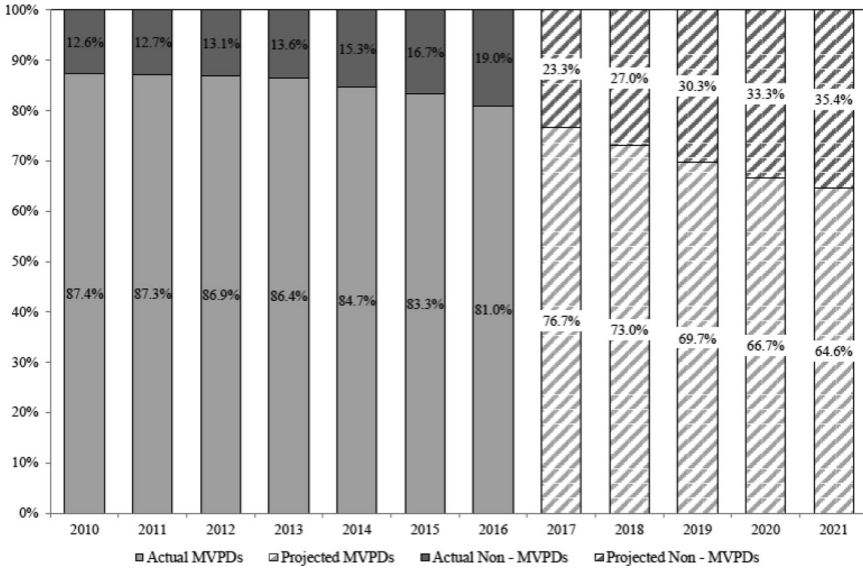


Figure 4. Percentage of US television households obtaining service from a multichannel video programming distributor (MVPD) (Expert Report of Dennis W. Carlton [redacted], *United States v. AT&T Inc.*, figure 15 [February 2, 2018]).

US television households at that time, and that figure was rapidly growing. For example, the AT&T expert presented the prediction (using data from SNL Kagan’s US multichannel industry benchmarks as of January 15, 2018) in Figure 4 that by 2021 35.4 percent of television households would not be obtaining video service from a traditional MVPD; that is, they would have cut the cord. If instead of the value of roughly 10 percent used by the government, one used a value of 20 percent for cord-cutting, the predicted net effect on retail prices would be a reduction in average retail prices of \$.17 (Rebuttal Expert Report of Dennis W. Carlton, paras. 66–72).

With respect to the bargaining split, the government assumed a 50 percent split and claimed that it was supported by estimates of the various parties’ weighted average cost of capital, whose ratios the government took as a proxy for bargaining strength (Expert Report of Carl Shapiro, p. 42). The reliance on the relative costs of capital comes from Rubinstein (1982), cited by the government expert, which shows how in a bilateral setting, using efficient contracts, the bargaining parameter could be related to the time discount rates (which are generally determined by the cost of capital) when offers are alternated. In Rubinstein’s model, there is never disagreement in equilibrium. The AT&T expert did not put forward an alternative figure for bargaining weights but explained that the government’s figure was inconsistent with materials cited by the government and that

the government's predictions of net consumer harm were not robust to changes in that assumed value for bargaining strength.²³

With respect to the departure rate, the government expert assumed a value of 9.4 percent (Expert Report of Carl Shapiro, p. 128), based primarily on a survey by Altman-Vilandrie, a consulting firm for Charter, which he claimed was also consistent with an econometric analysis of the Viacom/Suddenlink blackout, which both experts agreed was a relevant benchmark (Expert Report of Carl Shapiro, sec. 8.1). The merging parties presented testimony, credited by the court, that the survey was flawed. Furthermore, the departure figure for Turner (and no other network) had been increased at the last minute by the consultant at the urging of Charter (for more details, see Leon, Memorandum Opinion, pp. 122–29). The government expert claimed in court that even using the original figure of 5 percent, the government's model would predict harm to consumers, but that was incorrect, and the expert retracted the statement on rebuttal (Leon, Memorandum Opinion, pp. 128–29). In fact, had the original figure been used, the government's model would predict retail price reductions, not increases (Leon, Memorandum Opinion, p. 129; Rebuttal Expert Report of Dennis W. Carlton, para. 65). The AT&T expert pointed out that the government expert's estimates for the Viacom/Suddenlink blackout were contradicted by Suddenlink's public statements to investors that the impact of the blackout on departures was only about 2.0–2.5 percent. Furthermore, the government expert's econometric analysis failed to account for the fact that the entire industry experienced a downturn in subscribership at that time. Accounting for that downturn reduced the government expert's econometric estimate to 4.8 percent, which is more in line with Suddenlink's estimate and those of other industry analysts and participants (Rebuttal Expert Report of Dennis W. Carlton, paras. 56–57; Leon, Memorandum Opinion, pp. 129–31). Using a 5 percent departure rate, the government's model predicted average net declines in retail prices of \$.01 (Rebuttal Expert Report of Dennis W. Carlton, para. 65).

The AT&T expert also pointed out that MVPDs had long-term contracts in place such that Turner could not raise prices until the contracts came up for renewal. That fact could be incorporated into the pricing predictions. If one uses the corrected numbers discussed above, and if one also takes into account the price protections of existing contracts, the long-term impact of the merger on a roughly \$140 monthly retail bill would be a decrease of about \$.48, thus reversing the government's prediction of an increase of \$.27 per subscriber relative to trend (Rebuttal Expert Report of Dennis W. Carlton, para. 72). As noted above,

²³ The AT&T expert noted that the government expert relied on a document that claimed that MVPDs were paying more to Turner than the content was worth (that is, MVPDs would be better off not carrying the Turner networks). That fact called into question the credibility of the document, but if true, the implication would be that Turner networks were receiving all or almost all of the gains from trade. If the government had assumed that Turner received 71 percent or more of the gains from trade (holding other assumptions constant), its model would predict net consumer benefits (Rebuttal Expert Report of Dennis W. Carlton, sec. 6.E).

the price increase would be less with the merger, not that absolute prices would be lower.

3.4. *Relevance of Predictions in Light of Remedies and Industry Structure*

In addition to the assumptions and results presented above, there is a more fundamental question about whether the model captures enough of the salient details of the industry and transaction such that its predictions are relevant to postmerger outcomes regardless of the assumptions used. All models involve simplification, but ultimately the question is whether a model makes reasonably accurate predictions. If a model fails to account for core features of an industry, it would be surprising if it provides reliable predictions. In the AT&T/Time Warner case, the AT&T expert argued that the model's predictions were irrelevant in light of its failure to consider critical features of the transaction and market-place.²⁴

First, and most strikingly, the model did not account for the merging parties' contractual arbitration commitment. In the Comcast/NBCU merger, the government imposed a consent decree with a remedy to address the concerns about vertical integration. The key element of the consent decree was an agreement to engage in binding baseball-style arbitration in which, if the distributor invoked arbitration, the content provider could not withhold content during the proceeding. That is, the content provider could not unilaterally impose a black-out; instead, the distributor was guaranteed to retain access to the programming at prices to be determined by the arbitrator pursuant to a final-offer arbitration even if the distributor rejected all proposed terms from the content provider. Although not made explicit, presumably the government believed that the predicted price increases from the model in the Comcast/NBCU merger absent the remedy would not occur given the remedy. In the AT&T/Time Warner merger, the government refused to offer the same remedy. However, the parties made a unilateral binding contractual commitment to baseball-style arbitration that also provided that the distributor could continue to air the content after demanding arbitration. Again, the distributor was guaranteed access to the programming even if it rejected all proposed terms from the content provider. The government expert's model, using the theory of Nash bargaining, explicitly ignored the outside options created by this commitment. That meant that even if one believed the government expert's model, it was not a model of the merger being proposed.

Interestingly, the judge presiding over the AT&T/Time Warner trial also presided over the Comcast/NBCU consent decree and had been told for years by the government that the arbitration commitment was effective for Comcast/NBCU. Neither the government nor its expert provided a clear explanation as to why the

²⁴ Shapiro (2021, p. 314) claims that the AT&T expert criticized the model as "theoretically unsound" in spite of being an application of standard bargaining theory. The AT&T expert testified that the model was theoretically unsound for multiple reasons described in the text, the most important of which is that Shapiro ignored the arbitration commitment in his model (see Trial Test. of Dennis W. Carlton).

arbitration commitment should be any less effective in the AT&T/Time Warner merger than the government had been telling the judge it had been in the Comcast/NBCU merger.²⁵ Furthermore, the government expert clearly stated that his model, and its predictions, did not account for the arbitration commitment.²⁶

Second, the AT&T expert argued that other core features of the industry had not been correctly modeled. For example, while Nash-in-Nash bargaining is a well-known bargaining model, it is not at all clear that it is applicable in the video industry. As noted by 37 antitrust scholars in an amicus filing, the “simple Nash bargaining model . . . addresses one-shot, bilateral negotiation, while actual bargaining between video content providers and distributors is repeated and multi-lateral” (Brief Amici Curiae of 37 Economists, p. 15; see also Rebuttal Expert Report of Dennis W. Carlton, para. 35).²⁷ More generally, critiques about the model fell primarily into four categories. First, the simple Nash bargaining model assumes a one-shot game, but in the video industry, for example, negotiations play out over time, and reputation effects may matter. Second, the simple Nash bargaining model assumes a bilateral negotiation uninfluenced by the terms of other negotiations, but most-favored-nation clauses are common in the industry, so the outcome of one negotiation explicitly affects other negotiations, which violates the Nash assumption. Third, the model assumes away a wide range of real-world responses to a boycott, including, in particular, the ability of MVPDs to lower retail prices to retain subscribers in response to losing content (whether through an overall price decrease or through targeted promotional efforts). Fourth, as Rogerson (2020b, p. 428) notes—and the government expert conceded—the full model, including both bargaining and merger simulation, does not consider the effects of equilibrium feedback.²⁸ Given these limitations, it is notable that the government

²⁵ Shapiro (2021, p. 334) notes, “Judge Leon himself had been supervising that consent decree since 2011. DOJ had repeatedly told Judge Leon that binding arbitration was an effective remedy in the Comcast/NBCU merger.” Scott Morton (2018) does not address the arbitration commitment made or consider that such a commitment fundamentally changes the nature of the bargaining game.

²⁶ Shapiro (2021, pp. 334–35) comments, “At trial, AT&T argued that Turner’s offer of binding arbitration would prevent Turner from increasing prices to rival MVPDs. . . . My analysis addressed the merger between AT&T and Time Warner as originally proposed, not as it was modified in response to the DOJ complaint. . . . The appeals court accurately observed that my quantification of harm to consumer[s] ‘failed to take into account Turner Broadcasting System’s post-litigation irrevocable offers of no-blackout arbitration agreements, which a government expert acknowledged would require a new model.’” For further discussion, see Trial Test. of Michael Katz, pp. 2643–2757, *United States v. AT&T Inc.* (April 16, 2018).

²⁷ A separate brief (Brief for 27 Antitrust Scholars as Amici Curiae in Support of Neither Party, *United States v. AT&T Inc.*, No. 18-5214 [August 13, 2018]) supported aspects of the government’s appeal with respect to the government’s model. The court referred to the government expert’s model as a “Rube Goldberg” contraption (Richard J. Leon, Memorandum Opinion, p. 149). The AT&T expert noted that, although that would be one description of the government’s complicated model, in fairness to the government expert, economists often have such models, and there are such models in the literature (Trial Test. of Dennis W. Carlton).

²⁸ Shapiro (2021, p. 329) comments, “Rogerson (2020) correctly notes that the approach that I took ‘was not fully correct’ in the sense that I calculated [raising rivals’ costs] and [elimination of double marginalization] based on pre-merger prices rather than equilibrium prices.”

did not present any evidence that the model worked in the sense of being checked against any verifiable predictions.²⁹

Therefore, one possibility is that the government model as presented was flawed for any of a variety of reasons, and thus the predictions in the record are likely to be poor predictors of what transpired after the merger.³⁰ One fundamental test of whether the government was correct in bringing suit is whether Turner network prices increased because of the merger. (Again, even if there were such an increase, unless one looks at the effect on retail prices, one has not established competitive harm. But the mechanism for harm in the government's model is through increased content prices. Absent increased content prices, there can be no competitive harm in the model.)

4. What Can a Retrospective Analysis Test?

A retrospective analysis can test several claims. For our mergers, we can see whether the government or the merging parties' assumed values for key parameters (for example, profit margins) were correct. We have the information to do this for some parameters from the AT&T/Time Warner case but not for the Comcast/NBCU case. Importantly, we can check whether the government's predictions about price changes in content and final prices were correct. We can perform these checks for both the AT&T/Time Warner merger and the Comcast/NBCU merger, though we have more evidence on the assumptions used for the former. Finally, we can see whether any subsequent business developments provide information about the reasonableness of claims made during trial.

The changes in content and retail prices are informative in several respects. Alignment of the observed content and retail prices with the government's predictions would provide evidence in support of the model's ability to accurately predict the alleged adverse price effects. Conversely, lack of alignment would provide evidence that the government model was not able to accurately predict price effects, perhaps because of its omission of the arbitration agreement or another flaw discussed above.

The model can produce predictions of retail price increases or decreases depending on the assumed parameter values. Failure of a prediction of a price change could result from incorrect input assumptions, a problem with the model, or both. We discuss in Section 4.1 whether the government's assumed parameter values were accurate. However, regardless of the parameter values, the model by

²⁹ The government expert claimed that there was some limited support for his model's predictions based on a redacted FCC analysis of DirecTV and Fox conducted in 2010. However, the details of that analysis were not public and were not part of the discovery in the AT&T/Time Warner case, and the government expert did not do his own analysis of that transaction. The AT&T expert did analyze that transaction and found no evidence of a price increase associated with vertical integration (Rebuttal Expert Report of Dennis W. Carlton, para. 24). That testimony went unchallenged.

³⁰ It is also worth noting that in the presence of efficiencies, a remedy need not be 100 percent effective in eliminating a concern for the merger to be on net beneficial. For example, a remedy that is only 50 percent effective would still result in the government model predicting the merger to be on net beneficial, which would reduce average retail MVPD prices (Rebuttal Expert Report of Dennis W. Carlton, para. 41).

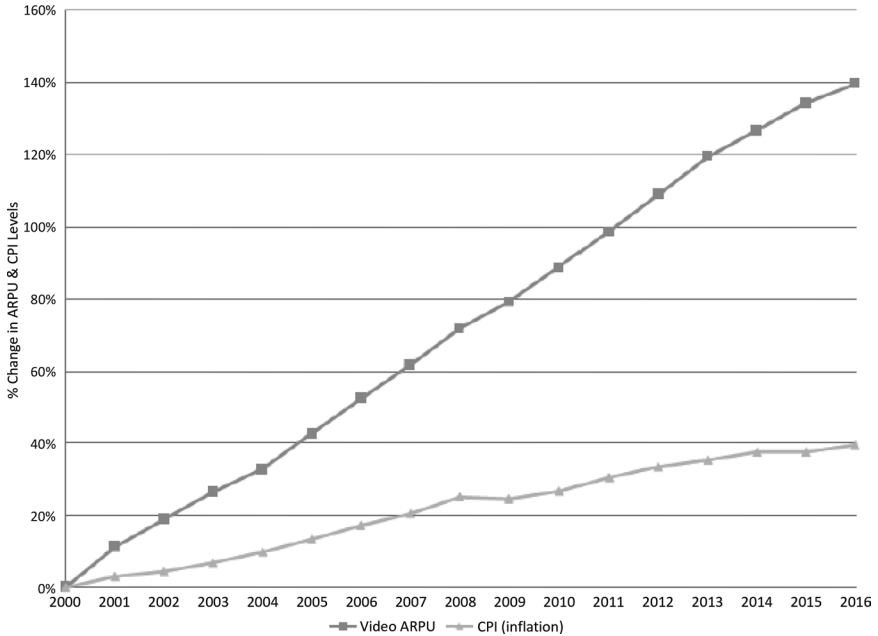


Figure 5. Growth in video average revenue per user (ARPU) versus growth of the consumer price index (CPI), 2000–2016 (Expert Report of Carl Shapiro [redacted], *United States v. AT&T Inc.*, figure 6 [February 2, 2018]).

construction always predicts a content price increase (although the magnitude may be de minimis).³¹ An actual decrease in price could be explained only by the presence of theoretical deficiencies in the model.³²

There is also a separate question of whether it is even possible to detect some of the predicted price changes. Any pricing effects are most likely to be detectable with respect to content prices, not retail prices. For example, in the AT&T/Time Warner case, while content prices were predicted by the government expert to change by a reasonably large amount in percentage terms (20 percent or more), the net predicted effect on retail prices was tiny (.19 percent). Given that MVPD ARPUs increased by about 5 percent to 15 percent a year between 2000 and 2016 (see Figure 5), it is not at all clear that a .19 percent change could be reliably de-

³¹ As explained above, the government's model was implemented in two stages, with the bargaining model that determines content prices treated independently from the merger simulation model and with no feedback effects modeled between the stages. Therefore, the model always predicts content price increases for a vertical merger. Note that in an equilibrium model with feedback between the two stages, this need not be the case if the elimination of double marginalization is sufficiently large.

³² For example, the government expert's implementation of the model held bargaining strength constant before and after the merger. If bargaining strength changed where it was not predicted to do so, then a content price decrease could occur where an increase had been predicted. However, that is far from the only possible omission from the model that could explain a faulty prediction of a content price increase. For example, the failure to accurately predict a content price decrease might be because the model omits the arbitration clause, and that clause matters.

tected even if it occurred.³³ Nonetheless, we consider the available evidence on retail prices below.

5. Available Evidence on Postmerger Outcomes

5.1. *The Comcast/NBC Universal Experience*

The government's expectation in the Comcast/NBCU case was presumably that the arbitration remedy would work, and so neither content nor retail prices would rise as a result of the merger.³⁴ If that expectation was incorrect, and the theory of harm was correct, one might expect to see higher content and retail prices as a result of the merger. If content and retail prices are not higher, it could be that the remedy was effective, the theory of harm was incorrect, or both. As we explain, the available evidence indicates that NBCU's content prices were not elevated as a result of the merger; either the government's theory of harm in that case was wrong, or the theory was correct but the remedy was effective.³⁵

The first piece of evidence on NBCU's content prices is simply the government's own assertions as to the effectiveness of its remedy. While the Comcast/NBCU consent decree was in effect, Judge Richard J. Leon presided over the AT&T/Time Warner trial. The DOJ had for years told Leon that the consent decree with Comcast/NBCU, including the arbitration commitment, had been effective, and even the government expert subsequently noted that "[t]he DOJ never adequately explained why the arbitration remedy used in the Comcast/NBCU merger was unacceptable for the AT&T/Time Warner merger" (Shapiro 2021, pp. 334).³⁶

The only published empirical retrospective on the Comcast/NBCU merger that the authors are aware of, Ford (2017, p. 1), finds "no systematic increase in the prices for Comcast's networks following the merger. . . . The evidence suggests either that there was no net positive effect on incentives to raise prices above competitive levels following the vertical merger, or else that the behavioral remedies placed on the Comcast-NBCU merger have been effective."

In the AT&T/Time Warner trial, the AT&T expert reported results on the Comcast/NBCU price effects based on a variety of econometric analyses using data from SNL Kagan (a standard industry source reporting estimates of average affiliate fees) and confidential data from DirectTV, Dish Network, and Char-

³³ One issue the AT&T expert raised at trial is related to burden of proof. The government's claim of net harm was not robust to a range of reasonable corrections to the estimated parameter values, as described above (Rebuttal Expert Report of Dennis W. Carlton, para. 42).

³⁴ Again, this scenario is relative to preexisting trends and other non-merger-related industry changes.

³⁵ Put another way, an observation of no harm is consistent with a flaw in the underlying model that predicted harm and/or the presence of an effective remedy.

³⁶ However, in his testimony at the AT&T/Time Warner trial, the government expert failed to address the relevance of the effectiveness of the Comcast/NBCU remedy on the evaluation of the proposed remedy in the AT&T/Time Warner matter.

ter produced during discovery.³⁷ The government identified DirecTV and Dish Network as Comcast's primary competitors and hence the MVPDs most likely for Comcast to target with increased NBCU rates. The AT&T expert showed that there was no evidence of any statistically significant increases, using any available data set, in NBCU's rates related to vertical integration with Comcast. To the contrary, the point estimates obtained from difference-in-difference analyses (estimated over the 2010–17 period, or 2010–15 for Charter) and cross-sectional analyses (estimated from 2017 cross-sectional data, or 2015 data for Charter) were typically negative—which indicates lower prices due to the merger. The only statistically significant results were negative (Expert Report of Dennis W. Carlton, sec. 5.C and app. C; Trial Test. of Dennis W. Carlton, pp. 2471–75). In sum, the econometric evidence on NBCU's content prices (affiliate fees) as of the time of the trial (2018), 7 years after NBCU's vertical integration with Comcast, indicates that there was no statistically detectable increase in NBCU's network affiliate fees, and the government presented no econometric evidence or claims to the contrary.

Because third-party data sources such as SNL Kagan use estimates that are sometimes revised, we use recent SNL Kagan data to reestimate the regressions related to the Comcast/NBCU case that were reported in the AT&T expert's report in the AT&T/Time Warner litigation.³⁸ Beginning with the difference-in-differences regressions, following the methodology presented by the merging parties and used by the Federal Communications Commission (FCC) in the Comcast/NBCU case, we assume that 20 percent of contracts roll off each year, so the full effect of the merger would be expected to have appeared by 2015 (Expert Report of Dennis W. Carlton, para. 191). We implement the same difference-in-difference methodology presented by the AT&T expert (both unweighted and weighted by 2010 affiliate revenues) for 2010–15 (a period used by the AT&T expert when, as noted, all contracts should have rolled over) and for 2010–17 (a period also presented by the AT&T expert).³⁹ We present cross-sectional analyses, also presented by the AT&T expert, in which the affiliate fees for the NBCU networks are compared with those of other top 50 networks, holding constant

³⁷ The SNL Kagan data are publicly available from S&P Global Market Intelligence. (The provider does not guarantee the accuracy or adequacy of its content and shall not be held liable for any damages or losses in connection with any use of the content.)

³⁸ While the sales data from Dish Network, DirecTV, and Charter used in the trial will not have changed, it would not be surprising if there were some differences in the point estimates based on the SNL Kagan data (see, for example, Giozov, Israel, and Shampine 2019).

³⁹ Following the difference-in-difference specification used in the AT&T expert's reports in the AT&T/Time Warner litigation, we regress the natural log of the affiliate fees of the top 50 basic cable networks on the natural log of programming fees (3-year moving average), Nielsen's prime-time ratings (3-year moving average), network and year fixed effects, and an indicator variable for the vertically integrated NBCU networks. This variable equals 0 in 2010, .2 in 2011, .4 in 2012, .6 in 2013, .8 in 2014, and 1 in 2015–17—an approach accounting for the staggered nature of contracts (see Rebuttal Expert Report of Dennis W. Carlton, sec. 5.C and app. C).

relevant factors such as programming expenses and ratings.⁴⁰ We apply the cross-sectional methodology to SNL Kagan data from 2015 (the year when contracts would have fully rolled over) and 2017 (also presented in the merging parties' work).

The results from the difference-in-difference regressions are presented in Table 1, and the estimates from the cross-sectional analyses are presented in Table 2. Given the log-log specification, the coefficients in both analyses may be interpreted as percentage effects on affiliate fees. Consistent with the findings presented at trial using company data, there are no statistically significant positive coefficients on vertical integration in any specification.⁴¹ Therefore, while some estimates are noisy, we conclude that it would be wrong to interpret the evidence, taken as a whole, as showing that there was competitive harm from the Comcast/NBCU merger. Either the theory of harm in the Comcast/NBCU case was incorrect or, as the government claimed, the remedy worked.

The Comcast/NBCU consent decree expired September 1, 2018. However, the DOJ notified Comcast that it would continue to monitor the firm even absent a formal consent decree structure, which calls into question how much of a change in regulatory oversight occurred (Chmielewski 2018). Nonetheless, we can look at publicly available data from SNL Kagan to see if there are any obvious discontinuities in NBCU's rates since the consent decree ended. As previously noted, given the existence of overlapping long-term contracts, any changes in average rates, such as those estimated by SNL Kagan, would be expected to appear gradually over the course of 5 years or so. On the basis of SNL Kagan data, average NBCU rates increased in 2018 but stayed relatively flat in 2019 and 2020. That timing is inconsistent with a hypothesis that rates increased substantially because the consent decree expired given that most, if not all, of the 2018 rate increases reflected in the SNL Kagan estimates were set pursuant to contracts signed during the consent decree period.⁴²

Nonetheless, we analyze the rates at the end of the consent decree, conducting a difference-in-difference analysis of NBCU rates in 2017–20 and a cross-sectional analysis using the last year of data available, 2020. We again account for the staggered nature of contracts by assuming a 20 percent annual contract roll-off, reflected in the NBCU End of Consent Decree Indicator, which equals 0 in 2017 (the last full year before expiration), .05 in 2018 (20 percent of approxi-

⁴⁰ Following the cross-sectional specification used in the AT&T expert's report in the AT&T/Time Warner litigation, we regress the natural log of the affiliate fees of the top 50 basic cable networks on the natural log of programming fees (3-year moving average), Nielsen's daytime and prime-time ratings (3-year moving averages), the natural log of daytime and prime-time delivery, network age, network genre fixed effects, and an indicator variable for the NBCU networks (see Rebuttal Expert Report of Dennis W. Carlton, sec. 5.C and app. C).

⁴¹ To the extent that the postmerger evidence indicates that content prices decreased, that would indicate that the model as implemented was incorrect, since, as explained in detail above, the model always predicts content price increases, all else equal.

⁴² Multiyear agreements typically specify prices by year, and those prices typically rise over time, often in a nonlinear fashion.

Table 1
NBC Universal Vertical Integration Difference-in-Difference Regressions

	2010–15		2010–17	
	(1)	(2)	(3)	(4)
NBCU Networks Vertically Integrated Indicator	–.035314 (.037552)	–.021429 (.053752)	.030880 (.034192)	.037505 (.040755)
Log(programming investment)	.220160* (.104646)	.147614 (.128398)	.273007* (.082762)	.194825* (.094669)
Nielsen prime-time rating	–.029238 (.090157)	–.116934 (.080581)	.001160 (.066939)	–.045421 (.047775)
Regression weighting	Yes	No	Yes	No
<i>N</i>	240	240	312	312
<i>R</i> ²	.999	.994	.998	.993

Note. The NBCU Networks Vertically Integrated Indicator equals 0 in 2010, .2 in 2011, .4 in 2012, .6 in 2013, .8 in 2014, and 1 in 2015–17. Regression weights in weighted specifications are 2010 network revenues. All regressions include network and year fixed effects. Standard errors clustered by owner are in parentheses.

+ $p < .1$.

* $p < .05$.

Table 2
NBC Universal Vertical Integration Cross-Sectional Regressions

	2015		2017	
	(1)	(2)	(3)	(4)
NBCU Vertically Integrated Networks Indicator	–.143069* (.039982)	–.109131* (.037672)	–.109912* (.058084)	–.099630 (.061002)
Log(programming investment)	.716526* (.181590)	.731904* (.137935)	.785865* (.216846)	.772942* (.170922)
Log(prime-time delivery)	.016006 (.356335)	–.232082 (.354404)	.175606 (.199836)	.005953 (.215414)
Log(daytime delivery)	–.248278 (.437618)	–.084375 (.428417)	–.460460 (.266932)	–.421995* (.201099)
Nielsen prime-time rating	.290538 (.518065)	.605586 (.439390)	–.103659 (.537610)	.356831 (.558099)
Nielsen daytime rating	.709280 (1.043590)	.212704 (.932923)	1.258820 (1.046729)	.737601 (1.060064)
Network age	.000177 (.000637)	.000672 (.000639)	.000748 (.000822)	.001104 (.000725)
Regression weighting	Yes	No	Yes	No
<i>R</i> ²	.974101	.878619	.964620	.879675

Note. Regression weights in weighted specifications are network revenues. All regressions include genre fixed effects. Standard errors clustered by owner are in parentheses. $N = 46$.

+ $p < .1$.

* $p < .05$.

mately one-quarter of the year after the consent decree), .25 in 2019 (first full year after the consent decree), and .45 in 2020.

The results from the difference-in-difference analysis are reported in Table 3, and the cross-sectional regression results are reported in Table 4. Given that the Turner networks underwent a change in vertical integration status during the period of study, they are excluded from the benchmark observations in some specifications.

To summarize, the noise in the estimates in Tables 3 and 4 prevents a fully conclusive statement, but the evidence does not support an inference that the competitive harms that induced the government to demand a consent decree materialized after it ended.⁴³ Since that theory of harm from a vertical merger was the same as that alleged in the AT&T case, we expect no harm to have emerged from the AT&T merger even in the absence of a contractual commitment modeled after the Comcast consent decree.

5.2. *The AT&T/Time Warner Experience*

For our retrospective analysis of the AT&T/Time Warner merger, we begin by noting that AT&T has spun off DirecTV and WarnerMedia. That indicates that the government's theory was incorrect, since one would presumably not sell off assets that create market power and increase profits. Indeed, of all the retrospective evidence we present, this evidence, based on business behavior subsequent to the merger, is likely the most powerful indication that the government's claims of harm to competition were wrong. That AT&T sold the assets off at a loss shows that its hopes for financial success were wrong. Nevertheless, it is the correct economic outcome for the government to allow mergers to go forward, absent competitive concerns, and let the parties enjoy the fruits of success or consequences of failure. Any attempt to defend the government's case on the grounds that it would have saved AT&T from a business mistake is misguided: that is not the role of an antitrust authority. We now turn to a discussion of parameter values before discussing content prices and retail prices.

5.2.1. Evidence on Model-Assumed Parameter Values

We now turn to a retrospective evaluation of the accuracy of the assumed parameter values used to estimate the model. To begin, we note that the assumed values were intended to be forward-looking. In particular, long-term contracts in place at the time of the merger would have prevented any predicted price increases, so the model's price predictions were relevant only years into the future

⁴³ Of course, it might be the case that the fear of DOJ scrutiny prevented any increases in content prices even after the consent decree expired.

Table 3
NBC Universal End of Consent Decree Difference-in-Difference Regressions, 2017–20

	With Turner Networks		Excluding Turner Networks	
	(1)	(2)	(3)	(4)
NBCU End of Consent Decree Indicator	.093042 (.058644)	−.033794 (.137805)	.109160 (.059757)	−.027939 (.147585)
Log(programming investment)	1.193218* (.610260)	1.482844 (1.046908)	1.026456 (.669169)	1.509077 (1.139976)
Log(prime-time delivery)	−.106137 (.109942)	−.206644 (.211819)	−.091341 (.135461)	−.233192 (.260714)
Regression weighting	Yes	No	Yes	No
<i>N</i>	164	164	144	144
<i>R</i> ²	.998795	.994398	.999033	.993774

Note. The NBCU End of Consent Decree Indicator is specific to NBC Universal networks (0 for all other networks) and equals 0 in 2017, .05 in 2018, .25 in 2019, and .45 in 2020. Regression weights in weighted specifications are 2017 network revenues. All regressions include network and year fixed effects. Standard errors clustered by owner are in parentheses.

* $p < .1$.

Table 4
NBC Universal End of Consent Decree Cross-Sectional Regressions, 2020

	With Turner Networks		Excluding Turner Networks	
	(1)	(2)	(3)	(4)
NBCU Vertically Integrated Networks Indicator	−.036998 (.043310)	−.088648 (.054992)	.006486 (.084998)	−.065835 (.083778)
Log(programming investment)	.836172* (.223572)	.779982* (.189628)	.768968* (.286630)	.760731* (.223012)
Log(prime-time delivery)	.042665 (.215938)	−.037462 (.188376)	.062784 (.239077)	−.077112 (.209270)
Log(daytime delivery)	−.219251 (.345395)	−.081261 (.233213)	−.248370 (.421304)	−.036044 (.247537)
Nielsen prime-time rating	.026074 (.426795)	.195788 (.258199)	.275065 (.354637)	.325422 (.327258)
Nielsen daytime rating	.460217 (.970424)	−.069193 (.499004)	.192424 (.890445)	−.280010 (.571453)
Network age	.000661 (.000898)	.000825 (.000753)	.000422 (.000923)	.000597 (.000795)
Regression weighting	Yes	No	Yes	No
<i>N</i>	46	46	41	41
<i>R</i> ²	.958258	.859249	.963374	.855032

Note. Regression weights in weighted specifications are network revenues. All regressions include genre fixed effects. Standard errors clustered by owner are in parentheses.

* $p < .05$.

and would depend on the assumed parameter values in those future years.⁴⁴ Thus, it is highly relevant whether the parameter values assumed at the time of trial have been borne out over time.

We are unaware of any new evidence for departure rates in the event of blackout. There have been no blackouts of the Turner networks, temporary or otherwise, since the merger. That is not surprising given the guarantee of continued carriage in the arbitration commitment.

The financial data relied on at trial for margins are not publicly available. However, it is clear that DirecTV's financial state has deteriorated, and AT&T has spun off DirecTV (see, for example, Blumenthal 2021). This means that the lower margins used by the AT&T expert were likely the more relevant ones, in contrast to those used by the government's expert.

With respect to diversion, the government relied on subscriber shares, and the data from SNL Kagan used by the government and the merging parties are publicly available, so we can see how matters have developed. The government expert assumed that satellite MVPD shares would remain constant and that cord-cutting would decline. The AT&T expert disputed those parameter values but conservatively used only a higher estimate of cord-cutting without assuming future increases. We look first at MVPD shares ignoring cord-cutting and then look at how cord-cutting has developed.

First, ignoring cord-cutting, we ask if DirecTV's share of MVPD subscribers has changed (since the diversion rate was assumed by the government to be proportional to DirecTV's subscriber share).⁴⁵ Contrary to the government expert's assumption that DirecTV's share would remain constant, subscribership to satellite providers like DirecTV declined faster than that for cable providers, which resulted in MVPDs' shares of satellite providers like DirecTV shrinking from roughly 34 percent in 2017 to roughly 27 percent in 2021 (SNL Kagan, US multi-channel industry benchmarks).

Second, let us consider cord-cutting. Contrary to the government expert's assumption that cord-cutting would decline in importance, but consistent with the AT&T expert's predictions, the incidence of cord-cutting has exploded. The AT&T expert used an estimate of 20 percent for the fraction of television households that would not be MVPD subscribers going forward, based on the fraction for which that was true at the time, but noted that SNL Kagan predicted that by 2021 35.4 percent of television households would not be MVPD subscribers. In

⁴⁴ Shapiro (2021, pp. 318–19) notes, “Turner would have the ability to set higher prices for these MVPDs only over time, as their contracts expired and were renegotiated. . . . The Appeals Court likewise stated: ‘Whatever errors the district court may have made in evaluating the inputs for Professor Shapiro’s quantitative model, the model did not take into account long-term contracts, which would constrain Turner Broadcasting’s ability to raise content prices for distributors.’” Shapiro appears to recognize that ignoring contracts that protect from harms is problematic, especially if the efficiencies (and consumer benefits) result immediately but the harms arise only in the future because of contractual protections.

⁴⁵ The government expert’s merger simulation was implemented using shares for groups of zip codes below the designated market area level. The national share was thus not a direct input but is illustrative of the unanticipated changes in the industry.

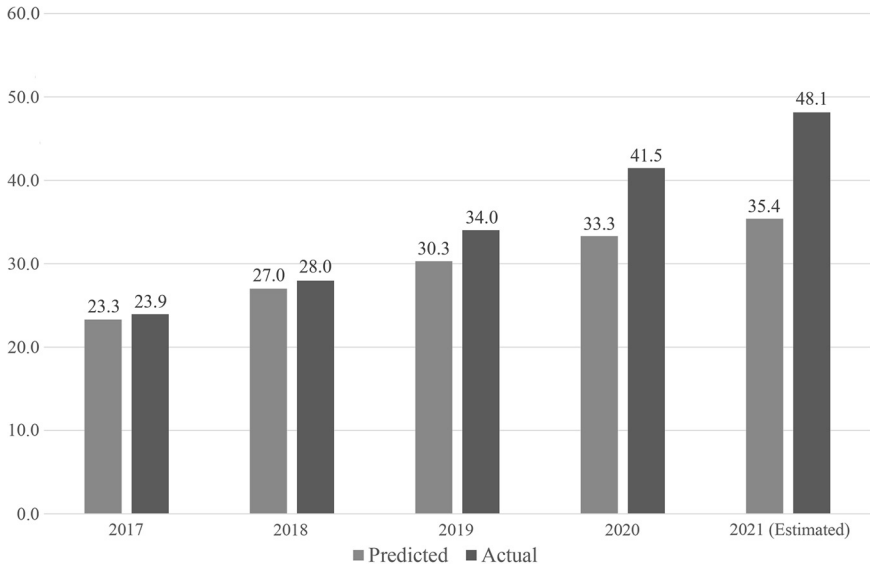


Figure 6. Fraction of television households without multichannel video programming distributor subscriptions.

fact, SNL Kagan (according to its US multichannel industry benchmarks) now estimates that 48.1 percent of television households no longer subscribe to MVPDs as of 2021. That is, roughly half of US households have become cord-cutters. Put another way, roughly 38 percent of households that subscribed to MVPDs at the time of the merger have cut the cord. And this increase is not simply due to the pandemic. The figures for cord-cutting have exceeded SNL Kagan's predictions in every year since the merger (see Figure 6, which uses data from SNL Kagan's US multichannel industry benchmarks, and Expert Report of Dennis W. Carlton, figure 15).

In summary, the AT&T expert's key forward-looking parameter values appear to have been more accurate than the government expert's. Indeed, the AT&T expert indicated that his assumed parameter values were conservative, and that appears to have been the case. Using the more recent data for the key parameter values to run the model would produce estimates of even greater declines in retail prices (relative to trend) than were presented by the AT&T expert at trial.

5.2.2. Evidence on Content Prices

As noted earlier, the model as implemented by the government expert always predicts a content price increase from the vertical merger (although it could be de minimis).⁴⁶ (Again, the mechanism of harm in the government's model oc-

⁴⁶ Recall that the government expert did not apply his model to HBO, which is sold as a stand-alone product.

curs through increased content prices. As explained above, to show a competitive harm on net, one must consider overall retail prices, not content prices.) However, while public data from SNL Kagan do suggest a change in trend since the merger, the change is downward, not upward. Figure 7 shows the sum of Turner network rates by year. While the change in 2020 is readily apparent, a quadratic trend line based on 2010–18 rates is fitted as a reference point. Notably, the quadratic trend fits the premerger experience very well, with Turner network prices falling below this trend only after the merger. Nor can this decline be explained by an industry-wide change. Figure 8 plots Turner network rates, indexed to 100 in 2014, against rates for other basic cable networks (excluding NBCU, given its change in integration and regulatory status). There is no corresponding industry-wide decline: Turner network rates declined against the industry in 2020.

This inconsistency between a decrease in content prices and the model's predictions of an increase is not a function of the model's parameter values, since any of the parameter values discussed will produce a predicted price increase from the vertical merger (given the separation of the upstream and downstream models described above). The problem must lie with the theoretical deficiencies of the model. However, the inconsistency does not by itself indicate what that problem is. One likely candidate, however, is failure to account for the arbitration commitment, which could create downward pricing pressure on content prices.

5.2.3. Evidence on Retail Prices

Given that there are no content price increases relative to trend in the post-merger period, the model's predictions about increased retail prices are irrelevant, as they are premised on content prices increasing. That is, any retail price increases cannot be due to the government's theory of harm because that theory was premised on content price increases (relative to trend) driving retail price increases. Nonetheless, we examine retail prices next.

Some commenters note that retail price increases at DirecTV and in wireless pricing shortly after the merger are evidence that the government's predictions of harm were correct (see, for example, Thomsen 2018; Baker 2020, pp. 10–11).⁴⁷ As noted above, however, even if the government's theory of harm were correct, the government expert did not predict retail price increases at DirecTV, nor did he predict retail price increases for AT&T's wireless services. Indeed, the government's theory of harm was entirely unrelated to wireless, and the government expert predicted price decreases at DirecTV (only prices for other MVPDs were predicted to increase slightly).

Commenters also suggest that increases in DirecTV's retail prices since the merger have shown harm to competition and that the government's predictions of lower retail prices at DirecTV were incorrect (see, for example, Khan 2020,

⁴⁷ Other commenters point to a multiyear blackout of HBO on Dish Network as evidence that the government theory of harm was correct (see, for example, Khan 2020, pp. 1673–74). But in fact the government expert never claimed an antitrust harm arising from HBO, or any of the Turner networks for that matter, being withheld from any distributor as a result of the merger.

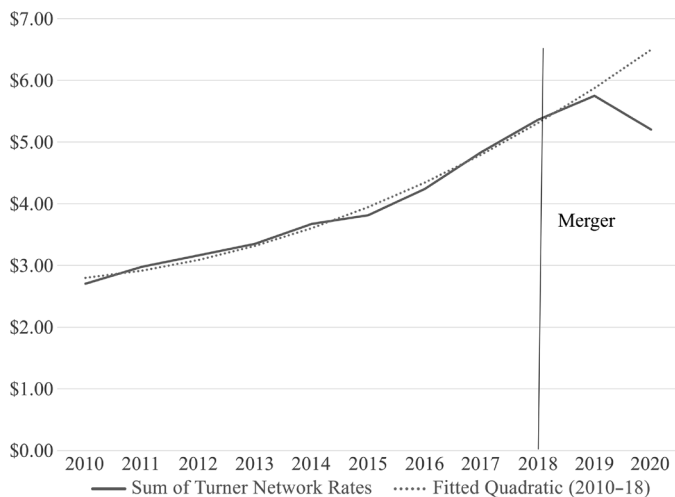


Figure 7. Turner network rates

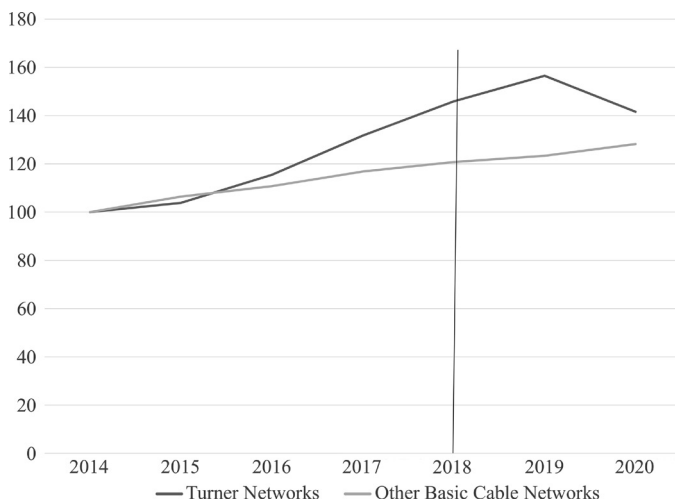


Figure 8. Turner network rates versus other basic cable network rates

pp. 1674–75). However, those commenters fail to recognize the overall upward trend in content and retail prices (although the government expert made a point of documenting those trends) and that any postmerger changes in price ought to be measured relative to those trends to avoid confounding preexisting industry trends with merger effects. Khan (2020), for example, fails to recognize that the predicted downward pricing pressure by the government’s model is measured at a point in time—prices at any point in time will be lower with the merger than

without the merger—and does not mean that the preexisting upward trend over time disappears. Hence, seeing that prices have risen since the merger, without controlling for the preexisting trend or any other marketplace changes, cannot isolate the effect of the merger (it is effectively an invalid merger retrospective), and thus it is uninformative about the effects of the merger or the validity of the model's predictions.

Finally, the magnitude of changes in retail price levels are out of line with the government's theory of harm. For example, Thomsen (2018), criticizing the merger decision, discusses a \$5 increase in the price of DirecTV Now. Other virtual MVPDs have also had multidollar price increases in recent years.⁴⁸ Those changes appear to be due to general changes in the industry, such as virtual MVPDs beginning to look more like traditional MVPDs in both content and price, and are not plausibly related to the government expert's predicted changes in content prices of less than \$1, changes that do not appear to have occurred.

5.2.4. Summary of Retrospective Evidence on the AT&T/Time Warner Merger

The retrospective evidence reveals that the government's claims of anticompetitive harm from the merger were wrong. The business decision of AT&T to spin off Time Warner is powerful evidence that the government's case was misguided. The government expert's assumed parameter values for the model produced predicted retail price increases, but those assumed values were unrealistic. The AT&T expert's alternative forward-looking assumed parameter values, which are closer to what has happened, produced predictions of decreases in retail prices (relative to trend and other industry changes). That fact indicates that the government should not have brought the case in the first place. The failure to find evidence of content price increases since the merger shows that the government expert's model was flawed, since the model always predicts content price increases from the vertical merger, all else equal. In any case, that content prices did not rise after the merger means that attempts to link the vertical integration to increased retail prices are inconsistent with the government's theory of harm. Finally, that the government claimed, and the evidence supports, that prices did not rise after the Comcast/NBCU litigation, a case involving similar issues and a remedy similar to the contractual arbitration remedy proposed by AT&T, is further confirmation that the government's claims of anticompetitive harm from the AT&T/Time Warner merger were wrong.

6. Lessons for Analysis of Vertical Mergers

In light of the discussion above, what general conclusions can we draw about vertical merger cases? First, the theory of vertical harm cannot and should not be dismissed out of hand as being inconsistent with economic theory. The theory is sound if applied in the right cases and supported with appropriate empirical

⁴⁸ For example, Sling raised its prices by \$5 at the end of 2019 (see Welch 2019).

evidence: the issue is whether it is empirically relevant to the industry under analysis. However, applying that theory to a particular industry can be tricky and if done in a faulty way will produce incorrect results.

Although we disagree with much of the government expert's testimony and claims in his recent article on the AT&T/Time Warner merger (Shapiro 2021), there are several points of apparent agreement. First, it is possible for vertical mergers to cause harm (even though, in our opinion, those circumstances are limited). Second, a vertically integrated firm will naturally seek to maximize its profits, and that means it will internalize externalities (such as double marginalization) that would otherwise exist. Third, the presence of contracts can protect against short-term harms while allowing efficiencies to be attained. Fourth, a full equilibrium model with feedback between the downstream and upstream markets is the appropriate one. Finally, when there is a proposed remedy, it should be accounted for in the economic analysis.

In general, it can be difficult to specify a model that accurately reflects the complex nature of real-world negotiations and industry facts, as is evident from the experience in the AT&T/Time Warner merger. All models involve simplification, but a key lesson from this retrospective is that when using complex models, verification of the reliability of the model in making predictions is desirable. If that is not possible, then it may be difficult to have any confidence in a model's predictions of harm.

Empirical evidence from prior transactions can be of great importance, especially if it is in tension with a model's predictions in the case under analysis. If a model predicts harm, as in the AT&T/Time Warner merger, but similar transactions, such as the Comcast/NBCU merger, have not produced harm, one should be highly skeptical of the model's predictions. This is especially important when using complex structural models to make predictions of harm. The ability to provide reduced-form studies of similar past transactions' effects strikes us as an important complement to any attempted structural modeling when such reduced-form studies are feasible.⁴⁹

That a remedy appears to have been effective both when implemented as a government consent decree and as a unilaterally imposed and self-enforcing contractual remedy is also of great interest. The government stated at the time of the AT&T/Time Warner merger that it did not wish to enter into a remedy that it would have to monitor on an ongoing basis. However, as discussed above, the unilaterally imposed arbitration commitment by AT&T was not a remedy to be administered by the government but a contractual one that directly changed the bargaining process and is privately enforced just like any other private contract. The government is not required to monitor or enforce it. The merging parties made a legally binding commitment to distributors negotiating for content, and

⁴⁹ Of course, reestimating the structural model for the past transaction and then examining whether its predictions turned out to be accurate would be desirable, but that might not be possible because of data requirements.

that contractual commitment is enforceable through the judiciary without any action by the government.

Although the government dismissed contractual commitments in the AT&T/Time Warner trial as a behavioral remedy that requires ongoing monitoring and thus would be likely to be less effective than structural remedies, in our view that characterization is misleading. The arbitration mechanism operates by changing the incentives faced by the merging party in negotiations relative to those it would face absent the contractual commitment. As such, it could be properly considered to be a structural remedy that, once imposed, requires only that firms operate in their own self-interest. In contrast, a behavioral remedy requires ongoing government monitoring because it typically requires firms to act in ways that are counter to their self-interest. This is not just a semantic debate about how to label the remedy: regardless of what label one uses to describe it, a contractual commitment like the one in the AT&T/Time Warner case alters the incentives of the parties after a merger, can prevent harms claimed by the government, and is self-enforcing, requiring no government monitoring or regulation (see, for example, Expert Report of Dennis W. Carlton, para. 94).⁵⁰

Some commenters suggest that allowing merging parties to offer a unilateral contractual remedy will make it more difficult for the government to bring challenges (see, for example, Shapiro 2021, pp. 335–36). However, that seems to be a socially beneficial outcome, not a concern. If the parties can offer an effective remedy, such that the benefits can be obtained without risk of harm, then the merger should not be challenged.

As a final suggestion, there may be a lesson to be learned about the presentation of complex economic models such as the government's model. In the AT&T/Time Warner litigation, AT&T took the unusual step of putting its expert witness on the stand right after the government's expert witness. This back-to-back testimony enabled an unusual opportunity to contrast the two testimonies without having the typical lengthy interlude between the testimony of the opposing economists. In some foreign jurisdictions and arbitrations, complex issues such as this are handled in expert-witness "hot tubs" where experts can be questioned together or even question each other. Similar arrangements could be beneficial to the finders of fact in future litigation.

In sum, the retrospective analysis here indicates that the government's model was incorrect in predicting harm from the AT&T/Time Warner merger. That does not mean that all vertical cases are wrong, nor should it discourage analysis of vertical mergers. But it does mean that marketplace and transaction details matter a great deal, and overconfidence in economic models that do not capture key theoretical or empirical details is dangerous and can lead to interference with business decisions that raise no competition concerns.

⁵⁰ Of course, the contractual commitment can fail to achieve its goal, but just as with other contractual provisions, that will depend on the circumstances.

Appendix

Details of the Government’s Model

The government expert’s model⁵¹ is based on a Nash bargaining solution for content prices, which involves maximizing the product of the gains from trade for the two parties. More specifically, if n_1 and n_2 are the negotiated payoffs and t_1 and t_2 are the threat points, or the payoffs if no agreement is reached, then the Nash bargaining solution is the pair n_1, n_2 that satisfies

$$\text{choose } p_1 \text{ to } \max(n_1 - t_1)(n_2 - t_2),$$

where n_1 and n_2 are functions of content price p_1 , holding all other prices constant, and t_1 and t_2 are functions of all other prices.

The Nash bargaining solution with symmetric bargaining strength is an even split of the gains from trade, which is also used by the government expert in his implementation of the model. However, he does allow for unequal bargaining power when applying the model to the case. More specifically, when applied to the case of a content provider u and an MVPD distributor d , with respective bargaining strengths α and $1 - \alpha$, then the following equality must hold:

$$(1 - \alpha)(\pi_u - \pi_u^{-i}) = \alpha(\pi_i - \pi_i^{-i}),$$

where π_u is the content provider’s profits when it sells content to all distributors, π_u^{-i} is its profits selling content to all distributors except distributor i in this negotiation, π_i is the profit of distributor i in the negotiation if it carries the content, and π_i^{-i} is its profit without the content.

As noted by the government’s expert, this can be solved to yield the premerger content price w_i (expressed in per-subscriber per-month terms):

$$w_i = \alpha \left[(p_i - c_i) \frac{\Delta_i^{-i}}{D_i} + \frac{\delta_i D_i^{-i}}{D_i} \right] - (1 - \alpha) \left[a_u - c_u + \frac{\sum_{j \neq i} (w_j + a_u - c_u) \Delta_j^{-i}}{D_i} \right],$$

where the term in the first set of square brackets multiplied by D_i (the number of subscribers at distributor i) is distributor i ’s gains from trade without transfers, and the term in the second set of square brackets multiplied by D_i is content creator u ’s gains from trade without transfers. The other terms are as follows: D_i^{-i} is the present discounted value of the number of subscribers if the content is permanently forgone, c_u is the content creator’s direct cost (per subscriber per month), c_i is the distributor’s direct cost, a_u is the content creator’s advertising revenue (also per subscriber per month), P_i is the distributor’s price per subscriber, Δ_i^{-i} is the number of subscribers the distributor loses if it no longer carries the content, and δ_i is the price response of the distributor when no longer carrying the content.

After the merger, the only change is that there is an additional element to the

⁵¹ The explanation of the model is adapted from Expert Report of Carl Shapiro, app. G.

content creator's gains from trade due to internalizing the effects of a permanent blackout on distributor i on the newly vertically integrated distributor d . The change in w can then be found simply by subtracting the two equations. Most of the terms drop out, as they are held constant, which leaves only the new internalized element, multiplied by the bargaining share of the content creator. The predicted change in content price is then equal to

$$\Delta w_i \equiv w_i^* - w_i = (1 - \alpha)(p_d - c_d - w_d) \frac{|\Delta_d^{-i}|}{D_i},$$

where p_d , c_d , and w_d are the vertically integrated distributor d 's price, direct cost, and content cost, and the final term is the gain in subscribers to the vertically integrated distributor d if distributor i does not carry the content. The final term can also be expressed as a departure rate times a diversion rate, or the constant annual subscriber loss rate such that it has the same present discounted value of firm i 's subscriber loss rate (\bar{L}) multiplied by the diversion rate γ_{id} (the fraction of lost subscribers from i that go to the vertically integrated distributor d). That yields

$$\Delta w_i \equiv w_i^* - w_i = (1 - \alpha)(p_d - c_d - w_d) \bar{L} \gamma_{id}.$$

These, then, are the four assumptions discussed earlier: the bargaining split, the margin of integrated distributor d , the departure rate, and the diversion rate.

References

- Baker, Jonathan B. 2020. Foreword. Pp. 9–11 in *Controlling Mergers and Market Power: A Program for Reviving Antitrust in America* by John Kwoka. Boston: Competition Policy International.
- Baker, Jonathan B., Mark Bykowsky, Patrick DeGraba, Paul LaFontaine, Eric Ralph, and William Sharkey. 2011. The Year in Economics at the FCC, 2010–11: Protecting Competition Online. *Review of Industrial Organization* 39:297–309.
- Beck, Marissa, and Fiona Scott Morton. 2021. Evaluating the Evidence on Vertical Mergers. *Review of Industrial Organization* 59:273–302.
- Blumenthal, Eli. 2021. DirecTV Completes Spinoff from AT&T, Will Turn AT&T TV into DirecTV Stream. CNET, August 2. <https://www.cnet.com/tech/services-and-software/directv-completes-spinoff-from-at-t-will-turn-at-t-tv-into-directv-stream/>.
- Carlton, Dennis W. 2009. Why We Need to Measure the Effect of Merger Policy and How to Do It. *Competition Policy International* 5:77–90.
- . 2020. Transaction Costs and Competition Policy. *International Journal of Industrial Organization* 73, art. 102539, 14 pp.
- Carlton, Dennis, Mark Israel, Ian MacSwain, and Eugene Orlov. 2019. Are Legacy Airline Mergers Pro- or Anti-competitive? Evidence from Recent U.S. Airline Mergers. *International Journal of Industrial Organization* 62:58–95.
- Carlton, Dennis W., Mark A. Israel, and Allan L. Shampine. 2019. Lessons from AT&T/Time Warner. *Competition Policy International Antitrust Chronicle* 1:1–5.
- Chmielewski, Dawn C. 2018. DOJ Notifies Comcast It Will Continue to Keep an Eye on the Company—Report. *Deadline*, August 30. <https://deadline.com/2018/08/doj-comcast>

- scrutiny-continue-post-consent-decree-nbcu-1202455013/.
- Crawford, Gregory S., Robin S. Lee, Michael D. Whinston, and Ali Yurukoglu. 2018. The Welfare Effects of Vertical Integration in Multichannel Television Markets. *Econometrica* 86:891–954.
- Ford, George S. 2017. *A Retrospective Analysis of Vertical Mergers in Multichannel Video Programming Distribution Markets: The Comcast-NBCU Merger*. Phoenix Center Policy Bulletin No. 43. Phoenix: Phoenix Center for Advanced Legal and Economic Public Policy Studies.
- Garza, Deborah A., Jonathan R. Yarowsky, Bobby R. Burchfield, W. Stephen Cannon, Dennis W. Carlton, Makan Delrahim, Jonathan M. Jacobson, et al. 2007. *Antitrust Modernization Commission Report and Recommendations*. Washington, DC: Antitrust Modernization Commission. https://govinfo.library.unt.edu/amc/report_recommendation/amc_final_report.pdf.
- Giozov, Georgi, Nauman Ilias, Mark Israel, and Allan Shampine. 2019. Vertical Integration in Multichannel Television Markets: Revisiting Regional Sports Networks Using Updated Data. *Criterion Journal on Innovation* 4:1–16.
- Hazlett, Thomas W. 2021. Antitrust Activists Want to Go Full Throttle. Here's a Lesson They Should Consider First. *Barron's*, July 29. <https://www.barrons.com/articles/antitrust-activists-want-to-go-full-throttle-heres-a-lesson-they-should-consider-first-51627509048>.
- Hosken, Daniel, and Christopher Taylor. 2022. Vertical Disintegration: The Effect of Refiners' Exit from Gasoline Retailing on Retail Gasoline Pricing. *Journal of Law and Economics* 65:423–64.
- Khan, Lina M. 2020. Book Review: The End of Antitrust History Revisited. *Harvard Law Review* 133:1655–82.
- Kovach, Steve, and Sam Meredith. 2021. AT&T Announces \$43 Billion Deal to Merge WarnerMedia with Discovery. CNBC, May 17. <https://www.cnbc.com/2021/05/17/att-to-combine-warnermedia-and-discovery-assets-to-create-a-new-standalone-company.html>.
- Kwoka, John. 2015. *Mergers, Merger Control, and Remedies: A Retrospective Analysis of U.S. Policy*. Cambridge, MA: MIT Press.
- Lafontaine, Francine, and Margaret Slade. 2007. Vertical Integration and Firm Boundaries: The Evidence. *Journal of Economic Literature* 45:629–85.
- . 2021. Presumptions in Vertical Mergers: The Role of Evidence. *Review of Industrial Organization* 59:255–72.
- Luco, Fernando, and Guillermo Marshall. 2020. The Competitive Impact of Vertical Integration by Multiproduct Firms. *American Economic Review* 110:2041–64.
- Reardon, Marguerite, and Mike Sorrentino. 2019. Justice Department Won't Appeal AT&T-Time Warner Decision. CNET, February 26. <https://www.cnet.com/news/justice-department-loses-appeal-to-bust-up-at-t-time-warner-merger/>.
- Rogerson, William. 2014. A Vertical Merger in the Video Programming and Distribution Industry: *Comcast-NBCU* (2011). Pp. 534–75 in *The Antitrust Revolution: Economics, Competition, and Policy*, edited by John E. Kwoka, Jr., and Lawrence J. White. 6th ed. New York: Oxford University Press.
- . 2020a. Comment on the U.S. Department of Justice and the Federal Trade Commission Draft Vertical Merger Guidelines. https://www.ftc.gov/system/files/attachments/798-draft-vertical-merger-guidelines/rogerson_verticalguidelines1_2.pdf.
- . 2020b. Modelling and Predicting the Competitive Effects of Vertical Mergers: The

- Bargaining Leverage over Rivals Effect. *Canadian Journal of Economics* 53:407–36.
- Rubinstein, Ariel. 1982. Perfect Equilibrium in a Bargaining Model. *Econometrica* 50:97–109.
- Salop, Steven C., and David T. Scheffman. 1983. Raising Rivals' Costs. *American Economic Review* 73:267–71.
- Scott Morton, Fiona. 2018. Why Behavioral Remedies Won't Work in the Case of AT&T–Time Warner. *ProMarket*, January 16. <https://promarket.org/2018/01/16/behavioral-remedies-wont-work-case-att-time-warner/>.
- Shapiro, Carl. 2021. Vertical Mergers and Input Foreclosure: Lessons from the AT&T/Time Warner Case. *Review of Industrial Organization* 59:303–41.
- Slade, Margaret E. 2021. Vertical Mergers: A Survey of Ex Post Evidence and Ex Ante Evaluation Methods. *Review of Industrial Organization* 58:493–511.
- Thomsen, Jacqueline. 2018. AT&T Customers See Price Increases following Time Warner Merger. *Hill*, July 3. <https://thehill.com/policy/technology/technology/395318-att-customers-see-price-increases-following-time-warner-merger>.
- US Department of Justice and the Federal Trade Commission. 2020. Vertical Merger Guidelines. https://www.ftc.gov/system/files/documents/reports/us-department-justice-federal-trade-commission-vertical-merger-guidelines/vertical_merger_guidelines_6-30-20.pdf.
- Welch, Chris. 2019. Sling TV Gets More Expensive, Raises Cheapest Subscription Price to \$30. *Verge*, December 23. <https://www.theverge.com/2019/12/23/21035080/sling-tv-orange-blue-price-increase-subscription>.
- Winston, Clifford. 2021. Back to the Good—or Were They the Bad—Old Days of Anti-trust? A Review Essay of Jonathan B. Baker's *The Antitrust Paradigm: Restoring a Competitive Economy*. *Journal of Economic Literature* 59:265–84.
- Winston, Clifford, Vikram Maheshri, and Scott M. Dennis. 2011. Long-Run Effects of Mergers: The Case of U.S. Western Railroads. *Journal of Law and Economics* 54:275–304.
- YouTube Team. 2021. YouTube TV and NBC Programming Update. *YouTube Official Blog*, October 2. <https://blog.youtube/news-and-events/youtube-tv-and-nbc-programming-update/>.