John Asker
UCLA Economics

“Economic models in Merger Analysis: The analysis of the ATT-DTV Merger before the FCC- Appendix C”

UCLA SCHOOL OF LAW
LAW & ECONOMICS WORKSHOP
Thursday, November 19, 2015
12:05 – 1:40 PM
Law Room 1314

For UCLA workshop. Please do not cite or quote without permission.
APPENDIX C

Analysis of Merger Simulation Models

TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Heading</th>
<th>Paragraph #</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>II. THE SIMULATION MODEL</td>
<td>6</td>
</tr>
<tr>
<td>A. Geographic Definition and Product Terminology</td>
<td>9</td>
</tr>
<tr>
<td>B. Deriving Shares and a Measure of Price from Data</td>
<td>12</td>
</tr>
<tr>
<td>1. Generating Shares</td>
<td>13</td>
</tr>
<tr>
<td>2. Creating a Simple Price Measure</td>
<td>17</td>
</tr>
<tr>
<td>C. Modeling and Estimating Demand</td>
<td>22</td>
</tr>
<tr>
<td>1. Modeling Demand</td>
<td>22</td>
</tr>
<tr>
<td>2. Estimating Demand Parameters</td>
<td>27</td>
</tr>
<tr>
<td>D. Modeling Pricing and Determining Marginal Cost</td>
<td>29</td>
</tr>
<tr>
<td>E. Solving for Post-Merger Prices</td>
<td>32</td>
</tr>
<tr>
<td>III. ECONOMIC EFFECTS CAPTURED BY THE SIMULATION MODEL</td>
<td>33</td>
</tr>
<tr>
<td>A. Horizontal Overlap</td>
<td>34</td>
</tr>
<tr>
<td>B. Programming Payment Reduction</td>
<td>36</td>
</tr>
<tr>
<td>C. Bundling Effects</td>
<td>38</td>
</tr>
<tr>
<td>IV. MODEL CORRECTIONS AND ADJUSTMENTS</td>
<td>42</td>
</tr>
<tr>
<td>A. Corrections to Price Recentering Procedure</td>
<td>45</td>
</tr>
<tr>
<td>B. Adjustments to Third-Party Prices</td>
<td>50</td>
</tr>
<tr>
<td>C. Programming Payment Reduction</td>
<td>55</td>
</tr>
<tr>
<td>V. RESULTS</td>
<td>78</td>
</tr>
<tr>
<td>A. Consumer Surplus Effects</td>
<td>79</td>
</tr>
<tr>
<td>B. Price and Share Effects</td>
<td>85</td>
</tr>
<tr>
<td>C. DMA Specific Effects</td>
<td>95</td>
</tr>
<tr>
<td>1. Market-Level Welfare Effects</td>
<td>97</td>
</tr>
<tr>
<td>2. U-verse Household Penetration and Market Outcomes</td>
<td>101</td>
</tr>
<tr>
<td>3. Maps of Main Simulation Results</td>
<td>104</td>
</tr>
<tr>
<td>D. Robustness: Outliers and Price Winsorization</td>
<td>108</td>
</tr>
<tr>
<td>E. Robustness: Appropriate Setting of the Pre-Merger Synthetic Bundle Discount</td>
<td>111</td>
</tr>
<tr>
<td>VI. COMPARISON WITH OTHER STUDIES</td>
<td>113</td>
</tr>
<tr>
<td>A. Studies of the U.S. Broadband Internet Service Market</td>
<td>115</td>
</tr>
<tr>
<td>B. Studies of the U.S. MVPD Market</td>
<td>121</td>
</tr>
<tr>
<td>VII. IMPLICATIONS</td>
<td>124</td>
</tr>
</tbody>
</table>

I. INTRODUCTION

1. This Appendix describes and presents our analysis of the merger simulation model (“BH Simulation”) that was submitted by Professors Steve Berry and Phil Haile on behalf of AT&T Inc. (“AT&T”) to evaluate the potential for unilateral effects that may arise as a result of its proposed acquisition of DIRECTV. (We refer to the two entities, collectively, as the “Applicants.”)

2. Unilateral effects, in this context, concern the incentive for AT&T to impose post-transaction price increases, particularly for video service. While the Applicants acknowledge the
potential for these effects, they claim that video and broadband services (the former of which are offered by each of the Applicants – though DIRECTV’s footprint and subscriber base are much more extensive than AT&T’s – and the latter of which are offered only by AT&T) are complements and, therefore, that the transaction would result in downward pricing pressure on the bundle that combines DIRECTV’s video service with AT&T’s broadband service. The Applicants argue that these marketplace-specific factors need to be weighed against any potential competitive harms that would arise from the transaction.

3. In support of the above claims, the Applicants submitted two merger simulation models. The initial submission included a merger simulation model submitted by Dr. Michael Katz, which is described in the Katz Declaration. Subsequent submissions were based on the BH Simulation submitted by Professors Berry and Haile. The Applicants represented the two models as closely related. After examining both models, we agreed with this assessment and focused on the BH Simulation, which is the more detailed and economically rigorous variant of the commonly adopted modeling approach. We find that the BH Simulation provides a good starting point to analyze potential unilateral effects. As discussed in detail below, we find that, after some corrections and incorporation of additional data, including information on potential programming payment reductions, the quantitative prediction of the model is that the transaction is likely to produce modest benefits to consumers through downward pricing pressure on the bundle that combines DIRECTV’s video service with AT&T’s broadband service, which, in turn, puts downward pricing pressure on bundles provided by cable companies. The programming payment reductions produce further consumer welfare gains, as those reductions will independently exert downward pressure on the price of AT&T’s video service.

---


2 See id.

3 See id. at 4-7.


It is important to note that the question posed in any merger simulation is: “Assuming that all industry participants’ product offerings remain the same, what price changes arise from the changed pricing incentives created by the proposed transaction?” The simulation predicts the transaction’s price effects, holding constant the industry product mix. The only dimension of adjustment that the BH Simulation allows is in the prices at which industry participants offer their products. In particular, while the BH Simulation captures the change in the combined firm’s pricing incentives as a result of the merger – and thus allows the price of the bundle that combines DIRECTV’s video programming service with AT&T’s broadband Internet access service to change endogenously – it does not assume that consumers will obtain any additional exogenous benefit from the post-merger integration of that (currently synthetic) bundle.\(^8\) The simulation also does not address issues involving post-merger anticompetitive incentives that AT&T and DIRECTV may have to reduce the ability of rivals to compete effectively. Rather, the BH Simulation provides a focused lens through which to consider changing pricing incentives created by the merger.

This Appendix proceeds as follows: In Section II, we describe the BH Simulation in detail. Section III discusses the economic effects that the model captures. In Section IV, we discuss adjustments that we made to the BH Simulation to address shortcomings of the original model. Section V presents the results of our analysis. Section VI provides a comparison of the results with results from previous studies in the economics literature. Finally, Section VII concludes.

II. THE SIMULATION MODEL

The BH Simulation is a sophisticated application of merger simulation techniques that are well accepted in the economic literature.\(^9\) The underlying structure of the BH Simulation builds on the discrete choice modeling approach to demand estimation combined with assumptions about the structure of a firm’s pricing decisions to arrive at a computationally feasible way to derive post-merger price predictions.\(^10\)

Given the inevitable constraints imposed on parties by limited data and the current state of the art in economic modeling, the submitted model is a very fine example of a merger simulation. This assessment is reflected in our adoption of the framework in reviewing the transaction. While we differ from the Applicants in the interpretation of certain simulation results and a few of the assumptions and

---

\(^8\) Because the BH Simulation ignores these possible benefits (which might include one-stop shopping, single installation, single bill, single customer-service contact, enhanced video-on-demand services, dynamic advertising, etc.), we do not discuss them in this Appendix. However, we acknowledge that, if - as the Applicants claim (see, e.g., Katz Decl. ¶ 26; Letter from Maureen R. Jeffreys, Counsel for AT&T, to Marlene H. Dortch, Secretary, FCC, MB Docket No. 14-90, Exhibit 1, “Expert Report of Dr. Ravi Dhar,” ¶¶ 9-17 (April 21, 2015); Letter from Maureen R. Jeffreys, Counsel for AT&T, to Marlene H. Dortch, Secretary, FCC, MB Docket No. 14-90, Exhibit 2, “2020 Value Proposition: Summary of US Consumer Quant Findings,” at 24 (April 21, 2015); Letter from Maureen R. Jeffreys, Counsel for AT&T, to Marlene H. Dortch, Secretary, FCC, MB Docket No. 14-90, Exhibit 3, “Consumer Communication Services Preferences: Enter Broadband Network Service Operators,” at 11-12 (April 21, 2015)) – such benefits exist, their presence would (all else being equal) tend to increase the transaction’s benefits for consumers.


\(^10\) See generally Berry-Haile Analysis.
data sources, the underlying approach is accepted as persuasive and as representing current best practice in merger simulation.

8. Merger simulation is typically a complex undertaking. The model can be thought of as a series of computations. The inputs into these computations are data on firms’ actual prices, subscriber shares, and product characteristics. The output is a set of prices for every type of product in the industry based on the new pricing incentives arising from the merger. There are several parts to the computations executed in the BH Simulation. These are: (1) deriving shares and a measure of price from data; (2) modeling and estimating demand; (3) modeling pricing; (4) estimating marginal costs; and (5) solving for post-merger prices. This section describes the key features of each of these steps. In this section, the discussion of the BH Simulation does not include any potential cost reductions that may result from the transaction. Because the simulation is somewhat complex, critical evaluation is left for subsequent sections.

A. Geographic Definition and Product Terminology

9. In the simulation, the estimation is performed at the level of a Designated Market Area (“DMA”). Within a DMA, consumers have access to different sets of products according to the availability of providers’ services. This access to different products is at the ZIP code level. The BH Simulation aggregates product availability at the ZIP code level, with data on subscriber shares from various sources, to generate product-level shares of the number of households purchasing that product at the DMA level. The BH Simulation also assumes that firm pricing of a product is fixed at the DMA level.

10. It is important to note at the outset that this merger simulation differs from others in that it includes a variety of products, not all of which compete with each other. The marketplace for broadband Internet access and video programming services allows bundling; that is, consumers can choose to purchase broadband only, video only, both from different providers, both from the same provider, or neither service (i.e., the outside good). Discussing these services requires precision in terminology. A consumer that chooses both broadband and video consumes a bundle. If the consumer purchases both from the same provider at a bundle-specific price, he or she consumes an integrated bundle at a bundle price. A synthetic bundle is purchased by a consumer that chooses two different suppliers for broadband and video services. An important consequence of this feature of the marketplace is that the “shares” measured here are not shares within a relevant product market, but percentages of consumers choosing a particular standalone service, synthetic bundle, or integrated bundle.

11 A Designated Market Area (“DMA”) is a Nielsen-defined television market consisting of a unique group of counties. The United States is divided into 210 non-overlapping DMAs.

12 See Berry-Haile Analysis at 20-33, 41.

13 See id. at 74.

14 A synthetic bundle can represent a contractual relationship between two providers, but this is not a requirement in the simulation model. That is, AT&T and DIRECTV jointly market a bundle that can be purchased by a consumer, but a consumer that simply chooses to purchase standalone AT&T broadband and standalone DIRECTV video under separate agreements would also be included in the share of consumers in the model that purchase the AT&T-DIRECTV synthetic bundle. Similarly, a consumer purchase of standalone cable video and standalone Telco broadband would be counted under the cable-Telco synthetic bundle share in the BH Simulation.

15 In particular, we avoid using the term “market shares,” because not all products considered here are in the same “market” (as the term is typically used in the antitrust context). In fact, the estimates show that standalone video components and standalone broadband components combined in synthetic bundles are complements – where raising (continued….)
11. A product is defined from a consumer’s viewpoint. Broadband services and video programming services each may be purchased as standalone services or may be bundled together, either from a single provider or from two different providers. As noted before, consumers can choose to purchase broadband only, video only, both from different providers, both from the same provider, or neither service. That is, an integrated bundle from AT&T, a synthetic bundle that combines DIRECTV’s video service with a cable provider’s broadband service, and a standalone broadband service offered by a cable provider are all examples of products from the point of view of the consumer, as defined in the BH Simulation. Individual firms, on the other hand, provide components (e.g., video component, broadband component, integrated bundle component). A synthetic bundle is not a component but is instead a product that comprises two components from different providers.\(^{16}\) Firms price components (e.g., the video component) that they offer, while consumers choose products (e.g., a synthetic bundle of broadband and video). A benefit of the structure of the BH Simulation is that it allows for a comparison between the harms from a reduction in competition in the video component and the potential benefits of strengthened incentives to reduce the price of the AT&T broadband-DIRECTV video bundle following the merger.

B. Deriving Shares and a Measure of Price from Data

12. The BH Simulation uses data on shares, consumer demographics, prices, and component characteristics. The data are drawn from several primary sources, including the Applicants’ information and web-scraped pricing information.\(^{17}\) As described below, Professors Berry and Haile use these data to estimate shares of products and also to construct a simple price measure for each product in each DMA.

1. Generating Shares

13. Professors Berry and Haile develop a methodology to construct DMA-level shares for all products. There is no single data source that provides this information. The primary data sources that Professors Berry and Haile use in constructing their DMA-level shares are: (1) the Applicants’ subscriber counts for all components; (2) aggregate video subscriber counts used for copyright payments from Cable Data Corporation; (3) Nielsen survey of video services; (4) Nielsen survey of Internet services; and (5) survey data, collected by Professor Ravi Dhar, from a large number of households on all video/broadband services, which included demographic data on households.\(^{18}\) Consumer demographics, other than those obtained in the Dhar survey, were collected from the U.S. Census.\(^{19}\)

14. Each of the data sources listed above only partially captures the full picture of video and broadband services that are purchased by consumers; no data source, by itself, gives a picture of the subscriber shares for all possible products. Furthermore, shares implied by the different data sources sometimes conflict. For instance, Nielsen survey data implies a subscriber count for DISH that exceeds DISH’s reported number of subscribers.\(^{20}\) Additionally, national video subscriber counts for AT&T were higher than copyright payments from the Cable Data Corporation indicated.\(^{21}\)

(Continued from previous page)
15. To reconcile these data sources and arrive at a coherent set of shares for each DMA, Professors Berry and Haile conduct a preliminary estimation exercise in which they infer the shares for all products implied by their data.\textsuperscript{22} This estimation procedure seeks to produce the shares that best fit the available data. It uses a weighted quadratic measure of fit across the five data sources. The weighted feature of this measure puts more weight on those data sources that appear more informative, while the quadratic feature penalizes large differences from observed data more severely than small deviations.\textsuperscript{23} Finally, Professors Berry and Haile note that the conflicts among data sources discussed above result in a differential bias, and they explore two approaches to correct for the bias.\textsuperscript{24}

16. We appreciate that dealing with multiple data sources is usually problematic. Nothing in the submission suggests that the problems encountered in constructing share measures are unusual. The solutions also seem reasonable. Further, the transparency with which the challenges are discussed is notable.

2. Creating a Simple Price Measure

17. To conduct a merger simulation, it is necessary to have a single price per product.\textsuperscript{25} This requirement necessitates the construction of a simple price measure from the large array of prices, plans, add-ons, and tiers offered by each firm in the industry. For the BH Simulation, price data come from two sources: (1) prices and plans matched to subscribers from the Applicants; and (2) web-scraped data on other firms’ prices and components.\textsuperscript{26} Professors Berry and Haile note the challenges in obtaining good price data. For example, they note the great variety of components, tiers, and add-ons, as well as differences between introductory prices and prices for continuing customers.\textsuperscript{27} Further, the collection of web-scraped prices of competitors creates a number of challenges, notably from: (1) ZIP codes where prices cannot be accessed but service is provided by a firm; (2) DMAs where pricing information was collected for a provider but where coverage information is unavailable; and (3) missing data on component characteristics.\textsuperscript{28} In each case, the BH Simulation interpolates the missing information from adjacent ZIP codes.\textsuperscript{29}

18. First, Professors Berry and Haile aggregate prices to the plan and ZIP code level. The AT&T and DIRECTV subscriber-level data are aggregated to the ZIP-plan level for customers in their first 12 months of service, and these data are combined with the web-scraped data collected at the ZIP-plan level for all the other firms.\textsuperscript{30} Professors Berry and Haile then regress price on quality measures (a flexible specification of broadband speed and/or the number of channels) and a set of firm, DMA, and

\textsuperscript{22} See id. at 20-33, 131-135.
\textsuperscript{23} See id. at 30. The Dhar survey is not representative of the entire population in each DMA. Hence, Professors Berry and Haile reweight the survey to make it representative. They do this by emphasizing some observations and de-emphasizing others using an estimation procedure in which they fit the survey statistics to statistics from the Consumer Price Survey conducted by the U.S. Census. See id. at 29-30.
\textsuperscript{24} See id. at 32-33; 131-135.
\textsuperscript{26} See Berry-Haile Analysis at 34.
\textsuperscript{27} See id. at 34. Their web-scraping data “often reveals only ‘introductory prices.’” See id. at 34.
\textsuperscript{28} See id. at 38.
\textsuperscript{29} See id. at 38.
\textsuperscript{30} See id. at 136.
The regression was run separately for each of the component types (i.e., video-only, broadband-only, and integrated bundles). For each of the specifications, the regression estimates a set of firm-component-DMA fixed effects that are used as price indices. These price indices are intended to capture cross-market variation within each component.  

Due to the adjustment for quality, the constructed price index can take on an arbitrary value. As the Applicants point out, the level of the value does not reflect anything of economic interest. However, the price index will accurately reflect the differences in price levels across firms, and, more importantly, changes in the price index will enable calculation of the aggregate effects of the merger on consumers. However, the use of this index approach has two economically relevant limitations.  

First, the price index does not reflect the range of prices and plans offered by a firm. A firm that offers both inexpensive, poor-quality plans and high-price, high-quality plans could well have the same price index as a firm that offers only medium quality and price plans. The price index will not reflect this difference in menu offerings, even if it is an important aspect of the competitive landscape.  

Second, some normalization (or “recentering”) of the index is helpful to ensure that prices are similar to the range of prices observed in the actual data. When done properly, the normalization has no effect on price movements and welfare measures in the BH Simulation, because any change in the normalization will be fully reflected in the component, provider, and product fixed-effect estimates included throughout each step of the simulation. As a result, the parameters of the conditional indirect utilities (other than the fixed effects) that feed into the share calculations will not change based on the normalization. Professors Berry and Haile choose to center the index using the AT&T Average Revenue per User (“ARPU”), so average prices for AT&T components in the model resemble their real-world analogues.  

C. Modeling and Estimating Demand  

1. Modeling Demand  

The demand model used in the BH Simulation assumes that each consumer chooses the product – either standalone video service from some provider, standalone broadband service from some provider, a bundle of both services from either a single or two separate providers, or the outside good – that maximizes his or her utility (taking into account the available products’ prices) among all available

---

31 See id. at 35, 137.  
32 See id.  
33 See id. at 137.  
34 See id. at 35.  
35 See id. at 37.  
36 As discussed in Section IV.A, the normalization procedure in the BH Simulation had a small coding error that we identified and corrected.  
38 See Berry-Haile Analysis at 35, 138; Berry-Haile Price Re-Centering at 1. The BH Simulation, as submitted by the Applicants, contained a small coding error in the price recentering procedure. We discuss the recentering procedure, and our correction to the coding error, in more detail in Section IV.A.
alternatives.\textsuperscript{39} This demand model takes a standard logit demand model and enriches it by imposing a nesting structure. We discuss the basic logit demand model first and then discuss the nesting structure that is added to it.

23. In the standard logit demand model, a consumer’s utility can be viewed as the sum of two parts: the first is common to all consumers and is called the “mean utility” (a function of the price, service quality, and other product and demographic characteristics).\textsuperscript{40} The second part is an idiosyncratic preference term, which captures the fact that individuals vary in their preferences for different products in random ways.\textsuperscript{41} This idiosyncratic component, which is unobserved by the econometrician, gives the model the flexibility to account for differences in consumer choices.

24. The model then aggregates the individuals’ choices, resulting in formulae for DMA-level shares for products that depend on prices (both the prices of the good and the prices of competitors’ goods) and product characteristics (such as broadband speed, number of video channels, and firm dummies).\textsuperscript{42} By assuming a particular distribution (which is the defining feature of the logit demand system) for the idiosyncratic component of consumer preference, the model can be fit to DMA-level data on shares, prices, product characteristics, and consumer characteristics (averaged over a DMA).\textsuperscript{43} The details of this aggregation in a logit-based merger simulation are standard in the literature.\textsuperscript{44}

25. The BH Simulation enriches the standard logit model described above by imposing a nesting structure – whereby the product space is partitioned into subsets, called nests, of similar products for which a consumer’s tastes are hypothesized to be positively correlated – to arrive at a nested logit demand model. The nesting structure introduces an additional individual-specific element to consumer utility and is an important feature that shapes the interactions among products.\textsuperscript{45} Compared to the

\textsuperscript{39} This behavioral assumption is a characterizing feature of discrete choice models, of which logit and nested logit (both discussed here) are two examples. See, e.g., KENNETH E. TRAIN, DISCRETE CHOICE METHODS WITH SIMULATION (Cambridge Univ. Press 2009) (“TRAIN (2009)”).

\textsuperscript{40} See Berry-Haile Analysis at 42.

\textsuperscript{41} See TRAIN (2009); Berry-Haile Analysis at 42.

\textsuperscript{42} See Berry-Haile Analysis at 42, 50, 61; Katz Reply Decl. ¶ 57.

\textsuperscript{43} The aggregation rests heavily on the use of the extreme value type I distribution to capture the idiosyncratic preferences of consumers. The use of this distribution has economic content. The set of values that a random variable drawn from this distribution can take is unbounded. Consequently, no matter how bad a product is, there is always some small chance that a consumer will buy it. This feature can lead to implausibly high prices for relatively undesirable products, as a few consumers (who have very low idiosyncratic draws on other products and high idiosyncratic draws on an undesirable product) will still find the undesirable product to be an attractive option. Of particular relevance in this merger simulation are the implications for the pricing of bundles and the standalone versions of their constituent components. If the price of the standalone version of a component that is sold as part of a bundle exceeds the bundle’s price, then no consumer should buy the standalone version, as the bundle is a cheaper way to get access to that component. (That is, consumers have free disposal.) By contrast, the modeling of idiosyncratic preferences violates this intuition, because each consumer is allocated independent random values that represent his or her idiosyncratic preferences for the bundle and each of the two standalone components. Independence implies that, if a bundle is priced at $80 and the standalone component at $100, some consumers will still buy the component. While the above situation is a theoretical possibility given this market structure, the BH Simulation as estimated does not generate implausible pricing patterns as described above. Furthermore, on the basis of a separate set of Monte Carlo simulations that we conducted, the BH Simulation’s results do not appear to be driven by the distributional assumptions.

\textsuperscript{44} See generally Berry (1994); Berry et al. (1995); Nevo, Mergers with Differentiated Products (2000).

\textsuperscript{45} See Berry-Haile Additional Discussion at 6.
standard logit model, the nested logit model allows substitution patterns between products to be more flexible and for the data to better guide these substitution patterns.\textsuperscript{46} The demand model in the BH Simulation uses four nests -- bundles, video only, broadband only, and neither (i.e., the outside good) -- and thus requires the estimation of three nesting parameters.\textsuperscript{47} (Because choices are driven by relative utility levels, the fourth nesting parameter, for the nest that contains the outside good, is pre-set to zero.\textsuperscript{48}) Thus, for example, a consumer that likes bundle A probably also likes bundle B.

26. Because product availability varies at a very local level, the demand model is formed at the individual level, aggregated to the ZIP code level (where the variation in choice sets is assumed to occur), and then further aggregated to the DMA level (where, in estimation, shares inferred by the model are matched to those generated by the data).\textsuperscript{49} Thus, for example, a consumer that likes bundle A probably also likes bundle B.

2. Estimating Demand Parameters

27. Due to the need to accommodate ZIP-code-level variation in product offerings, the estimation procedure requires non-linear numerical optimization.\textsuperscript{50} Cross-DMA price variation is determined, in part, through variation in product availability across ZIP codes within a DMA. (This variation is assumed to be exogenous).\textsuperscript{51} Absent this variation, the BH Simulation could be estimated linearly through standard (linear) instrumental variables techniques;\textsuperscript{52} indeed, apart from this variation, there is little that is unusual about the estimation procedure, which uses standard generalized method of moments (“GMM”)-based techniques.\textsuperscript{53}

28. In the estimated BH Simulation, the variables that determine demand and, thus, shares of demand are: (1) the DMA price indices of the components that make up the product (including any relevant discounts on synthetic bundles); (2) maximum download speed for broadband and maximum offered channels for video; (3) factors affecting Direct Broadcast Satellite (“DBS”) quality (such as latitude measurement, urban share of a DMA, and homeowner share of a DMA); (4) firm dummies; (5) interactions between DMA demographics (age, education, median household income) and nests; and (6) product dummies.\textsuperscript{54} Price is assumed to be endogenous, and instrumental variables are used to account

\textsuperscript{46} See Katz Reply Decl. ¶ 57. The standard logit demand model, in the absence of the nesting structure, has some economically undesirable properties. Most problematic is the fact that substitution among products due to a price change becomes a function solely of market shares. See Berry et al. (1995) for an extended discussion of this feature of the logit demand model.

\textsuperscript{47} See Berry-Haile Analysis at 45, 47. Although three parameters must be estimated, a simple specification sets the nesting parameter equal across nests.

\textsuperscript{48} See id. at 47-48.

\textsuperscript{49} See id. at 41.

\textsuperscript{50} See id. at 41, 50, 52, 55-60.

\textsuperscript{51} See id. at 41.

\textsuperscript{52} See id.

\textsuperscript{53} See id. at 140.

\textsuperscript{54} See id. at 51, 61; Katz Reply Decl. ¶ 57.
for this endogeneity. The instruments used follow those used in the 1995 analysis by Steven Berry, James Levinsohn, and Ariel Pakes.

**D. Modeling Pricing and Determining Marginal Cost**

29. After estimating demand for all products, the next step in the merger simulation is to use the prices at which each firm sells its components – a video-only component, a broadband-only component, or an integrated bundle – to determine the marginal costs of providing those components. The simulation assumes that each firm sets the prices that maximize its profits given its marginal costs, with the additional assumption that it takes the prices that other firms set for their components and bundles as given. From this the BH Simulation infers the marginal costs for which the observed prices would maximize profits for each firm. Knowing these marginal costs, the BH Simulation then estimates the profit-maximizing prices for all market participants following the merger, where the merging parties (AT&T and DIRECTV) now maximize profits jointly rather than separately.

30. To make estimation feasible, the BH Simulation restricts the price for a component or bundle to be constant within a DMA. This means that the price responses to competitors’ footprints occur at a DMA-wide level. With that, a firm’s profits are determined by adding up the profit it obtains from selling any particular component in any given DMA. The firm’s profit is derived by calculating the per-unit profit – the difference between the price the firm chooses for that product in that DMA and the marginal cost of providing that component in that DMA – and multiplying that times the quantity it would sell, which is based on the demand model estimated above.

---

55 See Berry-Haile Analysis at 44, 51, 140.

56 See id. at 51; see also Berry et al. (1995).

57 This is known as the Bertrand model with product differentiation.

58 See Berry-Haile Analysis at 72, 84. This technique is standard in the academic literature. See generally Berry et al. (1995); Nevo, Mergers with Differentiated Products (2000); Sofia Berto Villas-Boas, Vertical Relationships between Manufacturers and Retailers: Evidence with Limited Data, 74 REV. OF ECON. STUDIES 625, 625-652 (2007); Céline Bonnet & Pierre Dubois, Inference on Vertical Contracts between Manufacturers and Retailers Allowing for Nonlinear Pricing and Resale Price Maintenance, 41 RAND J. OF ECON. 139, 139-164 (2007).

59 See Berry-Haile Analysis at 72.

60 See id. at 74.

61 Provider penetration is assumed to be constant within a DMA between the pre- and post-merger scenarios. Penetration varies across DMAs, however, and firms may respond to higher competitor penetration by adjusting prices in that DMA.

62 See Berry-Haile Analysis at 81. A firm f’s profit in a DMA m, as a function of component prices in that DMA, is:

\[ \pi_f^m(p_f) = \sum_{r \in \mathcal{R}_m} (p_r^m - m_r^f) q_r^m - \frac{d}{2} \phi_r^f q_r^m, \]

That is, firm f’s profit is the sum over all components r offered in DMA m by firm f (with the set of components denoted by \( \mathcal{R}_m \)) of the price of that component \( p_r^m \) less the marginal cost \( m_r^f \) of providing it, all multiplied by the share of consumers that purchase the component \( q_r^m \). Finally, where relevant, half of the discount \( d \) that is offered on DIRECTV-AT&T and other DIRECTV-Telco or DIRECTV-cable synthetic bundles is subtracted and then multiplied by the share of consumers (\( \phi_r^f \)) that choose options that include the discount. If a firm does not offer a component that involves a discount, the last expression is equal to zero. The discount adjusts the price that is then folded into the share calculation. Hence, it is also present on the demand side, albeit buried in this expression. Optimal prices for a firm, given other firms’ prices, are given by the solutions to the firm’s first-order conditions, (continued….)
31. The BH Simulation accounts for discounts on synthetic bundles that combine DIRECTV’s video component with other providers’ broadband components, both those offered with AT&T broadband and those offered with broadband from other telecommunications and cable providers. This discount is treated as fixed at [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] in the merger simulation, regardless of the firm providing the broadband service, and assumes that the discount is split equally between the two firms – DIRECTV providing video services and the company offering the broadband service. This is modeled as decreasing the price of each component by half of the discount [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] if bought as a bundle, and the firm’s realized expenditure on the discount is treated as contributing to marginal cost.

E. Solving for Post-Merger Prices

32. Post-merger prices are derived by solving for the optimal prices of each firm, under the hypothetical post-merger industry structure, using the estimated marginal costs and demand system derived above, but where prices of AT&T’s and DIRECTV’s components are set to maximize joint profits after the merger. This changes the pricing incentives for these components and, as a result, changes the prices post-merger. In response to the change in AT&T’s and DIRECTV’s prices post-merger, prices adjust across the entire industry. The BH Simulation captures the changes in AT&T’s and DIRECTV’s pricing incentives and allows prices by all firms to adjust to the changed ownership. The prices ultimately derived by the BH Simulation are such that every firm is maximizing profits, taking as given the prices being offered by all other firms.

III. ECONOMIC EFFECTS CAPTURED BY THE SIMULATION MODEL

33. The merger simulation allows the estimation and comparison of three different economic effects. The first two are standard parts of any merger simulation: (1) the harm from increased prices resulting from eliminating competition between the merging parties and (2) the pass-through of any cost reduction resulting from the merger to consumers in the form of lower prices. The third effect results from the pricing incentives created by the fact that products include integrated bundles or synthetic bundles of individual components offered by firms.

A. Horizontal Overlap

34. A merger between two firms that supply substitute products may reduce competition by enabling the merged firm to increase joint profits by unilaterally raising the price of one or both products

(Continued from previous page) which set the partial derivatives of the above expressions with respect to the firm’s components’ prices equal to zero:

\[
\frac{\partial \pi^f_n}{\partial p^f_n} + \sum_{n' \neq n} \left( \pi^f_{n'} - mc^f_{n'} \right) \frac{\partial c^f_{n'}(p_{n'})}{\partial p^f_n} = 0.
\]

The full set of optimal prices, which is defined by the set of first-order conditions, does not have a closed-form expression and is determined computationally.

63 See Berry-Haile Analysis at 77. The DIRECTV synthetic bundle discount is assumed to apply to all synthetic bundles offered with Telco broadband service. The simulation also accounts for a [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] discount offered by DIRECTV with [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.].

64 See id. at 77.

65 See id. at 90.

66 See id. at 101-108.
above the pre-merger price. The merged firm may profit from this strategy, because some of the sales lost due to the price increase would be diverted to the product of the merger partner. In addition, firms that compete against the merged firm now face a competitor with less incentive to offer low prices. As a consequence, equilibrium prices across the industry may rise as well.

35. In 77 DMAs, both DIRECTV and AT&T offer video services. (This figure represents 36.7 percent of the 210 total DMAs.) According to the Applicants, DIRECTV’s video subscriber share in the areas in which AT&T U-verse is available to at least 90 percent of households is percent, and AT&T’s share is approximately percent. Although AT&T and DIRECTV are not each other’s closest substitutes, the diversion rates between them are non-trivial. The estimated diversion rates imply that approximately percent of AT&T’s video subscribers that leave in response to an AT&T price increase would go to DIRECTV’s video service. Furthermore, conditional on the availability of AT&T’s video service, approximately percent of DIRECTV’s subscribers that leave in response to a DIRECTV price increase would go to AT&T for video service. Therefore, AT&T’s and DIRECTV’s video services are substitutes to a degree that raises the potential for the merger to reduce horizontal competition as described in the previous paragraph.

B. Programming Payment Reductions

36. The Applicants claim that the transaction would result in reductions in program payments. This effect can be thought of

---


68 Whether such a strategy would be profitable depends on the relative margins of the two products. See id.

69 See id.

70 In its filings, AT&T indicated that, in September 2014, AT&T U-verse video passed at least one home in 77 unique DMAs. See AT&T Inc. Response to Sept. 9, 2014, Information and Discovery Requests, transmitted by letter from Maureen R. Jeffreys, Counsel for AT&T, to Vanessa Lemmé, Media Bureau, FCC, MB Docket No. 14-90, Exhibit 3.a.1 (Oct. 7, 2014) (“AT&T Response to Sept. 9, 2014, Information Request”). Although some commenters assert that U-verse video is available in more than 77 DMAs, we rely on data submitted by the Applicants for our analysis herein. See, e.g., Petition to Deny of Writers Guild of America, West, Inc., MB Docket 14-90, at 4, 9 (filed Sept. 16, 2014); Reply Comments of Writers Guild of America, West, Inc. to Opposition, MB Docket 14-90, at 1, 3 (filed Jan. 7, 2015) (stating that U-verse is available in 129 DMAs).

71 See Katz Additional Detail ¶ 58.

72 The diversion rates presented here were generated by the BH Simulation at pre-merger prices. For purposes of comparison, the estimates at post-merger prices – based upon the Modified Simulation (as defined below) and an assumed reduction (also discussed below) in the marginal cost of AT&T’s video component – are approximately percent for the AT&T to DIRECTV diversion and percent for the DIRECTV to AT&T diversion. Usually a substantial unilateral post-merger price increase requires that a significant fraction of the customers purchasing one product view the other product as the next best choice. However, this significant fraction does not need to approach a majority. See DOJ/FTC 2010 Horizontal Merger Guidelines § 6.1 at 20-21.

73 See Application, Description of Transaction, Public Interest Showing, and Related Demonstrations, transmitted by letter from Maureen R. Jeffreys, Counsel for AT&T, to Marlene H. Dortch, Secretary, FCC, MB Docket No. 14-90, at 35 (filed June 11, 2014) (“Application”); Katz Decl. ¶ 115; Joint Opposition at 16; AT&T Response to Sept. 9, 2014, Information Request at 244.
as a reduction in the marginal cost of providing service. The extent to which this potential cost reduction benefits consumers is a function of the extent to which the payment reductions are realized, and the extent to which the cost reduction is passed through to consumers. If the payment reductions are large and are substantially passed through to consumers, consumers could see lower prices after the merger, even with reduced competition. These lower prices offered by the merged entity, in turn, may induce other industry participants to reduce their prices as well.

37. The BH Simulation incorporates the effect of lower programming payments that result from the transaction by reducing the marginal cost of the AT&T video components by a flat [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] .

C. Bundling Effects

38. The last economic effect is the way the merger changes pricing incentives when integrated and synthetic bundles are available. Quantifying this effect is the novel feature of the BH Simulation.

39. Consider two firms, each of which supplies one component of a synthetic bundle. Each firm wants to set the price of its component so as to maximize its own profit. In doing so, it ignores the impact of its own price on the other firm’s revenue. More specifically, when a firm sets a high price, it ignores the fact that this high price will drive some consumers away from the other firm’s component, thus reducing the other firm’s revenue. However, if the providers of the components of the synthetic bundle merged, the combined firm would internalize the tendency of a high price on one component to reduce the revenue earned by the other component. Provided that nothing else changed, the combined firm would offer the newly integrated bundle at a price that is below the sum of the prices of the two products making up the synthetic bundle. For this reason, a merger would put downward pressure on the price of the bundle.

40. AT&T and DIRECTV offer a synthetic bundle. By merging, the pricing incentives for the parties would likely be to lower the price of the newly integrated bundle. If the price of the newly integrated bundle of AT&T’s broadband service and DIRECTV’s video service falls, then this effect may induce other industry participants that also offer bundles to lower those bundles’ prices.

41. The BH Simulation incorporates the effects of reduced horizontal competition, reduced payments for programming, and the benefits from offering an integrated instead of a synthetic bundle.

---

74 In a merger simulation, the pass-through rate will be heavily influenced by the choice of functional form that is used to model consumer demand, because the pass-through rate is a function of the second derivative of the demand function.

75 See Berry-Haile Analysis at 109.

76 See Application at 65-67; Katz Decl. ¶¶ 66-69, 74; Guyardo Decl. ¶ 27; Joint Opposition at 14; Katz Reply Decl. ¶ 12; AT&T and DIRECTV, White Paper, Why the “Double Moral Hazard” Problem Cannot be Resolved by Contract, at 4-6, transmitted by letter from Maureen R. Jeffreys, Counsel for AT&T, to Marlene H. Dortch, Secretary, FCC, MB Docket No. 14-90 (filed Nov. 12, 2014). These distortions are a version of the standard double-marginalization problem found in the economics literature on interactions between upstream and downstream firms. See LUIS M. B. CABRAL, INTRODUCTION TO INDUSTRIAL ORGANIZATION (The MIT Press 2000) for a simple explanation.

77 See Katz Decl. ¶¶ 33-34. AT&T also currently offers an integrated bundle of U-verse video and broadband. DIRECTV, however, does not provide a broadband service, and therefore is able to offer only synthetic bundles to customers that want both broadband and video services. See id. ¶¶ 15, 28-29.

78 See Application at 64; Katz Decl. ¶¶ 3-4, 89, 92.
The data are guiding the relative strengths of these three effects. The output of the model is the impact on consumers of the combination of these three economic factors.

IV. MODEL CORRECTIONS AND ADJUSTMENTS

42. In the next section, we report the basic results from two versions of the BH Simulation. The first version, called the “Corrected Simulation,” is a modification of the version of the BH Simulation that the Applicants submitted on September 23, 2014. The Corrected Simulation corrects minor coding errors that remained in the recentering procedure of the hedonic pricing model in both submitted versions of the BH Simulation. We describe this correction more fully in the paragraphs that follow, but the primary economically important difference is that consumers are estimated to be slightly more price-sensitive in the Corrected Simulation relative to the estimates derived from the September 2014 BH Simulation.

43. The second version, called the “Modified Simulation,” uses billing data from third-party cable providers (where possible) in place of the web-scraped pricing data in the BH Simulation. These data are also described in this section. In the Modified Simulation, consumers are more price-sensitive than in the Corrected Simulation.

44. Last, we discuss differences between the BH Simulation and our two models in the handling of programming payment reductions. We find that the reduction in programming payments that should be modeled in the simulation is likely lower than that claimed by the Applicants.

A. Corrections to Price Recentering Procedure

45. As described above, the BH Simulation requires a single price for each product in each DMA. Professors Berry and Haile construct a single price index for each product through a hedonic regression of firm prices on component characteristics. Three separate hedonic regressions are performed, one each for standalone video, standalone broadband, and integrated bundles. The hedonic regressions are performed at the “provider-ZIP-service plan” level and include as regressors the speed of the broadband service, the number of video channels, indicator variables for premium channels (e.g., HBO), and fixed effects for provider, DMA, and provider-DMA. The fixed effects from these regressions are saved, to be added later to the average prices centered on AT&T’s ARPU.

79 See Berry-Haile Updated Results. The BH Simulation that the Applicants submitted in September 2014 corrected two errors from their initial submission: one was an error in the construction of some prices, and the second was a coding error that affected the calculation of the Generalized Method of Moments (“GMM”) weight matrices and standard errors. Professors Berry and Haile assert, in the September filing, that these corrections have no material effect on the results or conclusions of their analysis. See Berry-Haile Additional Discussion at 1 n.1.

80 See Berry-Haile Analysis; Berry-Haile Updated Results.

81 Additionally, the estimated nesting parameters imply that, relative to consumers in the Corrected Simulation, consumers in the Modified Simulation that buy bundles are more likely to substitute to other bundles following a price change, and consumers in the Modified Simulation that buy standalone products are less likely to substitute to standalone products of the same type following a price change.

82 See supra ¶¶ 17, 30.

83 See Berry-Haile Analysis at 35; Berry-Haile Price Re-Centering at 1.

84 See id.

85 See Berry-Haile Analysis at 137; Berry-Haile Price Re-Centering at 1.

86 See Berry-Haile Analysis at 35, 137–138; Berry-Haile Price Re-Centering at 1.
46. After each regression is estimated and the fixed effects are saved, Professors Berry and Haile calculate a weighted-average fixed effect separately for each component for five provider types (AT&T, DIRECTV, Cable, Telco, and DISH).\(^{87}\) Professors Berry and Haile then calculate the weighted average AT&T fixed effect by averaging the predicted values of the regression using only the AT&T observations.\(^{88}\) The AT&T fixed effect is then subtracted from the fixed effect of all other providers to preserve the average differences in prices across provider types.\(^{89}\) These differences are then added to AT&T’s estimated video, broadband, and bundle ARPs (calculated separately from AT&T list prices), which give the new “center” for the price indices.\(^{90}\) This center is then added to the fixed effects from the original hedonic regression, which reintroduces the variation in product prices across DMAs.\(^{91}\)

47. In principle, this recentering of prices does not change the results produced by the demand model estimation or merger simulation.\(^{92}\) The reason is that the demand estimation contains a full set of provider, DMA, and component dummies that control for the mean price level.\(^{93}\) Additionally, in the merger simulation, the estimates of markups and all estimated changes in prices are unaffected by the price recentering as the level of prices passes directly through to marginal cost estimates.\(^{94}\) However, in our analysis of the BH Simulation, we found a small coding error in the way the recentering was done for the bundles offered by non-AT&T “Telco” providers.

48. The error is due to the manner in which Professors Berry and Haile handle missing observations in the web-scraped pricing data. In some ZIP codes, a single Telco offers an integrated bundle, and the prices of those bundles were centered at the “bundle” center by the recentering procedure. Likewise, the prices for standalone broadband and standalone video products offered by Telcos in these ZIP codes were centered at the broadband and video “centers,” respectively. However, in order to allow for the possibility of a synthetic Telco-Telco bundle where one Telco provides the video component and another provides the broadband component (but neither offers an integrated bundle), Professors Berry and Haile construct a synthetic bundle by summing the prices of the standalone components. However, they create this synthetic bundle after performing the recentering procedure, which results in synthetic Telco-Telco bundles being centered at a different mean than the integrated Telco-Telco bundles.

49. With Telco bundles being centered at two different locations, the original BH Simulation results are sensitive to the choice of normalization, because Telco-Telco synthetic bundles and Telco-Telco integrated bundles are not distinguished in the demand estimation and merger simulation. Accordingly, we adjust the code to ensure all Telco-Telco bundles are recentered at the same location.

---

\(^{87}\) The weighted-average fixed effect is calculated by setting the regressors for broadband speed, number of channels, and premium channels to zero, and taking the average of the predicted values (or “intercepts”) that come out of the regression. The weights used to calculate the weighted-average fixed effect are the DMA coverage percentages of each provider.

\(^{88}\) Again, the fixed effect is calculated by setting the regressors for broadband speed, number of channels, and premium channels to zero, and taking the average of the predicted values that come out of the regression. As only the AT&T observations are used, only the AT&T fixed effect is set to one in the predictions; all other provider fixed effects are set to zero. The weights used to calculate the weighted average AT&T fixed effect are the total number of AT&T subscribers across DMAs.

\(^{89}\) See Berry-Haile Price Re-Centering at 1.

\(^{90}\) See id.

\(^{91}\) See id.

\(^{92}\) See Berry-Haile Analysis at 37, 138; Berry-Haile Price Re-Centering at 2-3.

\(^{93}\) See Berry-Haile Analysis at 37; Berry-Haile Price Re-Centering at 2-3.

\(^{94}\) See id.
and we report these results as the “Corrected Simulation” below. The results in the Corrected Simulation are not dramatically different from those from the BH Simulation, but the effect is that consumers are estimated to be slightly more price-sensitive.95

**B. Adjustments to Third-Party Prices**

50. The data used in the BH Simulation are described in Section II.B. Data used by Professors Berry and Haile on prices, plans, add-ons, and tiers of service at the ZIP code level for third-party providers were collected via web scraping. By contrast, information on AT&T and DIRECTV prices, plans, add-ons, and tiers was drawn from own-party subscriber billing data. These data are used to construct a price index for different components across DMAs and providers.96

51. An examination of the pricing data described above raises three issues. First, there is an extremely wide range of prices in the own-party subscriber data submitted by AT&T and DIRECTV, with some of the prices taking on unrealistic values. The own-party subscriber-plan data exhibits variation across ZIP codes, with prices that vary markedly within plan, sometimes by hundreds of dollars. In addition, observations across the entire data set take values that seem inconsistent with established industry pricing patterns. For example, individual plan prices span from less than a dollar to over $2,400 per month in some ZIP codes. Most web-scraped data did not exhibit these two features, though there is one exception: the web-scraped data for Comcast also exhibited extreme variation in some instances (both within plans and across ZIP codes).

52. A second issue is whether there exists sufficient variation in observed prices offered by providers across DMAs to generate the price index that feeds into the demand estimation. Third-party data scraped from the Web exhibit little to no fluctuations in plan prices across ZIP codes.97 Of the 59 providers in the raw data, only Comcast (among the providers with web-scraped data) and AT&T and DIRECTV (both with own-party subscriber data) showed meaningful variation in plan prices across ZIP codes. The majority of the other third-party providers with web-scraped data had prices that showed very little variation in the data which is fed into the hedonic regression. This raises the concern that the bulk of the economically meaningful variation in the pricing data used in the simulation comes from only three firms (the two Applicants and Comcast).

53. The third issue is that prices produced via web scraping were, by construction, advertised introductory prices, whereas the Applicants’ subscriber data relied on actual prices. Actual and advertised introductory prices may exhibit different patterns, and it was not immediately clear which would be the more appropriate pattern on which to base the simulation.

54. A desire to improve the underlying data feeding into the demand estimation and merger simulation led us to request ZIP-code-by-plan-level pricing data from Comcast, Time Warner Cable, and Charter.98 We replaced the web-scraped data in the original BH Simulation with the actual pricing data

---

95 Although the differences between the results of the BH Simulation and the Corrected Simulation are not dramatically different, the consumer surplus benefits from the transaction are found to be less in the Corrected Simulation than in the BH Simulation and are slightly negative in one specification. These results are described further in the sections that follow.

96 See supra Section II.B.2.

97 For example, even though Verizon and DISH comprise [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent of total observations, prices for each plan offered by the two providers do not vary at all across geographic areas.

98 See Comcast Corporation Response to Jan. 8, 2015, Information and Data Request, transmitted by letter from Kathryn A. Zachem, Senior Vice President – Regulatory and State Legislative Affairs, Comcast Corporation, to Marlene H. Dortch, Secretary, FCC, MB Docket No. 14-90 (Jan. 23, 2015) (“Comcast Response to Jan. 8, 2015, Information Request”); Time Warner Cable Inc. Response to Jan. 8, 2015, Information and Data Request,
submitted by the third-party cable companies. In the results below, the versions of the merger simulation run with the updated third-party data is referred to as the Modified Simulation. The third-party data had fewer extreme values than the web-scraped data (particularly in the case of Comcast), exhibited significantly more variation across ZIP codes than the web-scraped data (in the case of Time Warner Cable and Charter), and better matched the patterns, in a qualitative sense, seen in the subscriber level prices submitted by AT&T and DIRECTV and used in the BH Simulation.

C. Programming Payment Reductions

55. The last adjustment we make to the merger simulation is the size of the programming payment reductions that accrue to, as a result of the transaction, products that include AT&T’s video service. One of the central claims by the Applicants is that, following the transaction, AT&T’s programming payments will be reduced to [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.]. The Applicants have stated that they expect that AT&T’s programming payments will be about [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent higher than DIRECTV’s prior to the date that the transaction is expected to close, and that this difference will remain at approximately [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent into future years absent the transaction. Additionally, in their evaluation of the transaction, the Applicants use a model to estimate that AT&T’s programming payments will grow from [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] in 2014 to [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] by 2023, increasing at a rate of approximately [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent per year. This model also estimates that DIRECTV’s programming payments (excluding [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.]) will grow from [BEGIN VIDEO PROG. CONF. INFO.] [END VIDEO PROG. CONF. INFO.] in 2014 to [BEGIN VIDEO PROG. CONF. INFO.] [END VIDEO PROG. CONF. INFO.] in 2023, increasing by approximately [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent over the next two years before leveling off at approximately [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] to [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent growth thereafter. AT&T’s modeling predicts a [BEGIN HIGHLY CONF. INFO.]


99 We continue to use the web-scraped data in the estimation for all other third-party providers other than Comcast, Time Warner Cable, and Charter.

100 See Application at 36; Katz Decl. ¶ 115; Application, Declaration of Rick L. Moore, Senior Vice President, AT&T, transmitted by letter from Maureen R. Jeffreys, Counsel for AT&T, to Marlene H. Dortch, Secretary, FCC, MB Docket No. 14-90, ¶ 15 (filed June 11, 2014); Joint Opposition at 16; Katz Reply Decl. ¶ 32; AT&T Response to Sept. 9, 2014, Information Request at 244. The combined firm may also enjoy increased bargaining power due to the loss of an independent video provider and the larger combined subscriber base, though the Applicants do not consider the potential impact of these in terms of efficiencies of the transaction. See Katz Decl. ¶ 115.

101 See AT&T Response to Sept. 9, 2014, Information Request at 243; AT&T Response to Sept. 9, 2014, Information Request, Exhibit 69.c.2, tab “Content Costs (Output).”

102 See AT&T Response to Sept. 9, 2014, Information Request, Exhibit 69.c.2, tab “Content Costs (Output).”

103 See id. [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] costs are projected to increase absent the transaction from [BEGIN VIDEO PROG. CONF. INFO.] [END VIDEO PROG. CONF. INFO.] per subscriber per month to [BEGIN VIDEO PROG. CONF. INFO.] [END VIDEO PROG. CONF. INFO.] over the same time frame. See id.
56. AT&T claims that, after the transaction, programming payments for AT&T U-verse video will fall to [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent per subscriber per month (in 2015) to approximately [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent per subscriber per month in 2020 and thereafter, once the companies combine. The end result is that AT&T expects its programming payments to fall by approximately [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent per subscriber per month to approximately [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent per subscriber per month.

57. Although we are unable to assess the Applicants’ claims regarding the future growth in the payments for video programming, we can assess the extent to which AT&T’s programming payments are higher than those currently paid by DIRECTV. We requested channel-by-channel programming payments for all channels the parties offer over their MVPD services. We also requested similar data from Comcast, which is currently the MVPD with the largest set of subscribers. Using these data, we compare the actual per-channel amounts that these providers pay to acquire video programming. The results are presented in Table 1.

58. The first row in Table 1 reproduces AT&T’s own estimates of the programming payments of the three MVPD providers, as reported in AT&T’s response to specification 69 of the Commission’s Information Request. AT&T has the highest estimated payments at [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent per subscriber per month, which is approximately [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] more than DIRECTV’s payments and approximately [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] more than Comcast’s payments. In percentage terms, AT&T’s modeling shows DIRECTV’s payments being [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent lower than AT&T’s payments and that Comcast’s payments are [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent lower than AT&T’s payments.

59. The second row in Table 1 reports the programming payment per subscriber as estimated from the channel-by-channel data submitted by the Applicants and Comcast in response to the Information Requests. The totals include the payments from all channels offered by each provider, regardless of whether the channels are offered by one of the other two providers. The totals are also

---

104 The phase-in assumes that AT&T will realize [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] and thereafter. See AT&T Response to Sept. 9, 2014, Information Request, Exhibit 69.c.2, tab “Content Costs (Output).”

105 See AT&T Response to Sept. 9, 2014, Information Request, Exhibit 69.c.2, tab “Content Costs (Output).” Percentages calculated by comparing the AT&T costs per subscriber to the “rebased” AT&T costs per subscriber in the spreadsheet.

106 See id., Exhibit 40 a-c; Information and Discovery Requests, transmitted by letter from William M. Wiltshire, Counsel for DIRECTV, to Marlene H. Dortch, Secretary, FCC, MB Docket No. 14-90, Schedule 37 (Oct. 7, 2014). We use the data from March 2014 in our analysis, which corresponds to the time period analyzed by Professors Berry and Haile in the merger simulation.


108 See AT&T Response to Sept. 9, 2014, Information Request, Exhibit 69.c.2, tab “Content Costs.”

109 Retransmission consent fees paid to local broadcast television stations are excluded from these totals, as are the fees for many of the premium channels (e.g., Showtime, Encore, etc.) which do not appear to be comparable across (continued….)
weighted by the share of customers subscribing to each channel so that they represent average per-subscriber payments. AT&T’s estimated payment per subscriber from the channel-by-channel data is [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.]. Similarly, the estimated per-subscriber payment from the channel-by-channel data is [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] for DIRECTV (giving a difference of about [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] between AT&T and DIRECTV) and [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] for Comcast. In percentage terms, the difference between AT&T and DIRECTV programming payments is approximately [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent, which is similar to the [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent reduction the Applicants expect in future years under the transaction and nearly identical to the percentage difference estimated in AT&T’s model in 2014 (shown in row 1).110 It is, however, lower than the current [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent difference claimed by the Applicants elsewhere in their filings.

60. The difference between the per subscriber payments for video programming between AT&T and DIRECTV from the channel-by-channel data is likely driven by three separate factors. First, for the channels that both AT&T and DIRECTV offer to their subscribers, AT&T typically pays a higher price per subscriber for the content, likely because it has fewer subscribers (and a weaker bargaining position) than DIRECTV. This effect can be seen in the second panel of Table 1, where we report the per-channel fee that each provider pays for a subset of common national television networks.111 As an example, AT&T paid [BEGIN VIDE PROG. CONF. INFO.] [END VIDEO PROG. CONF. INFO.] per subscriber for the USA Network, while DIRECTV paid only [BEGIN VIDE PROG. CONF. INFO.] [END VIDEO PROG. CONF. INFO.], and Comcast paid [BEGIN VIDE PROG. CONF. INFO.] [END VIDEO PROG. CONF. INFO.].

61. A second factor that may contribute to differences in per-subscriber programming payments across providers is that providers offer different sets of channels to their subscribers. All else being equal, a provider that chooses not to offer certain channels on any of its service tiers will have lower per-subscriber payments than a provider that does offer those channels. Although most providers will offer the most popular national networks to their subscribers, there is significant variation among the smaller niche and regional channels that each of the providers offer.

62. In the channel-by-channel data submitted by the providers, AT&T reports prices for 425 channels offered over its MVPD service, DIRECTV reports prices for 306 channels, and Comcast reports prices for [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] channels. Of these channels, 194 are reported by all three providers. We match the license fees and subscriber counts of these 194 common channels and calculate the monthly payment per subscriber for each of the three providers. The third row of Table 1 contains these estimates.

(Continued from previous page) __________________________

providers. For these reasons, the numbers presented in row 2 are likely to be lower than those presented in row 1, and focus should be placed on the percentage differences between the providers within each row.

110 See Application at 36; Katz Decl. ¶ 115; Joint Opposition at 16; Katz Reply Decl. ¶ 32; AT&T Response to Sept. 9, 2014, Information Request at 244.

111 MVPD providers will sometimes purchase a bundle of channels from a content provider rather than paying for each channel separately. For example, AT&T purchased the [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] channels as a bundle, reporting a single price for all of the channels. DIRECTV and Comcast, however, reported most of these channels under separate prices. For comparison, we aggregate the prices of individual channels to the bundle level when at least one of the providers makes a bundle purchase.
Table 1: Programming Payments per Video Subscriber for AT&T, DIRECTV, and Comcast

Not surprisingly, after dropping the smaller channels that do not appear on all three services, the estimated programming payments fall quite substantially. However, the payments fall more for AT&T than they do for DIRECTV or Comcast. The monthly per-subscriber payments for AT&T for the channels that are not offered across all three providers make up [BEGIN HIGHLY CONF. INFO.] of the total per-subscriber costs reported in row 2. However, the incremental costs to DIRECTV and Comcast for the channels that are not offered across all three providers are only [BEGIN HIGHLY CONF. INFO.] and [BEGIN HIGHLY CONF. INFO.], respectively. In the case of DIRECTV, this may be partly due to the fact that a higher percentage of the channels reported by DIRECTV matched with the channels reported by AT&T and Comcast. As a consequence of the higher cost of non-matched AT&T channels, the percentage differences between AT&T’s per-subscriber payments and the per-subscriber payments of the other two providers are lower than those reported in row 2 – though more so for DIRECTV than for Comcast. AT&T pays [BEGIN HIGHLY CONF. INFO.] per subscriber per month for these [BEGIN HIGHLY CONF. INFO.] matched channels, and DIRECTV pays [BEGIN HIGHLY CONF. INFO.] per subscriber per month for those same channels. The relevant takeaway is that, in percentage terms, the difference between the AT&T and DIRECTV payments for the channels that all three companies offer is approximately [BEGIN HIGHLY CONF. INFO.] percent, about [BEGIN HIGHLY CONF. INFO.] percent points lower than the claimed [BEGIN HIGHLY CONF. INFO.] percent reduction the Applicants expect to eventually achieve, about [BEGIN HIGHLY CONF. INFO.] percent difference in the channel-by-channel data when all channels are considered, and about half of the [BEGIN HIGHLY CONF. INFO.] percent difference the Applicants claim in their filings currently exists between the two companies.

A third factor that contributes to the differences in the providers’ per-subscriber video programming payments concerns the distribution (i.e., tiering) of subscribers across the full range of channels offered by a provider. An MVPD that has a larger fraction of its subscribers receiving higher-cost programming will have higher overall per-subscriber costs, even if the per-subscriber fee for each channel is the same for all MVPDs. An MVPD decides the tiers, but a programmer may negotiate to have its channel carried on a lower tier (to reach more subscribers) in return for a lower payment. In this sense, the tiering of programming by a particular provider (i.e., the bundling of channels into service tiers

---

112 A programmer may also negotiate with the MVPD to have one or more of its channels placed in a given “neighborhood” as well as a specific tier. For example, a sports programmer may want to ensure that its channel is grouped with the sports channels of other programmers on the MVPD’s channel lineup. Further, broadcast stations have to be on the lowest tier and available to anyone buying cable. See generally Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming, MB Docket No. 14-16, Sixteenth Annual Report, 30 FCC Rcd 3253, 3272 ¶ 41, 3294 ¶ 94 n.311 (2015).
that must be purchased by the customer as a package) can have a significant impact on the per-subscriber payments for content.

65. To understand how this distributional effect affects video programming payments, we recalculate AT&T’s per-subscriber payments of the 194 matched channels using AT&T’s current subscriber-share weights, but setting the per-channel prices in this calculation to the lower of the two prices currently received by AT&T and DIRECTV. This calculation estimates the per-subscriber fees that AT&T may end up paying once it is folded under DIRECTV’s contracts after the transaction, were it to keep the distribution of subscribers over these channels at current levels. The calculation allows AT&T to benefit from the lower prices currently paid by DIRECTV but fixes the relative tiering of channels that currently exists between AT&T’s and DIRECTV’s service offerings.113 This estimate is found in row 4 of Table 1.

66. When AT&T receives the more beneficial per-channel fees (but holding constant the share of subscribers receiving each channel), AT&T’s estimated per-subscriber payments are [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] for the [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] matched channels. This figure is lower than the [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] that AT&T pays for these channels under its current prices by approximately [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent, but higher than the [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] that DIRECTV is currently paying for those same channels. In other words, of the [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent difference between the payments of the two providers seen in row 3, [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percentage points are attributable to lower per-channel prices, and [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percentage points are attributable to DIRECTV offering these channels to a smaller share of subscribers (most likely on higher service tiers).

67. As noted above, there appear to be three factors driving the estimated differences in programming payments across MVPDs: differences in the per-subscriber fees paid for individual channels, differences among the sets of channels that the MVPDs offer to their subscribers, and differences in MVPDs’ distributions of subscribers across available channels (i.e., service tiers). It is important to understand the impact of each of these factors, not only when predicting how AT&T’s programming payments may potentially change as a result of the transaction but also when deciding how to account for these changes in the merger simulation.

68. The BH Simulation implicitly assumes (as is standard in merger simulation analysis) that product characteristics remain fixed between the pre- and post-merger scenarios. Thus, reductions in programming payments that reflect reductions in programming quality should not be considered in the calculation of transaction-related differences in consumer surplus.

69. Of the three factors presented above, only the first – the channel-by-channel differences in fees – potentially represents an unambiguous benefit to consumers were it to be realized by AT&T post-transaction. If, as claimed by AT&T, its per-subscriber programming payments would be reduced to DIRECTV’s level as a result of the transaction, a portion of this savings may be passed on to consumers, which would lead to an increase in consumer surplus.

70. The second factor leading to differences in programming payments between AT&T and DIRECTV (i.e., DIRECTV offering fewer channels to consumers) has an ambiguous consumer welfare effect. Suppose that AT&T were to drop channels that DIRECTV does not offer. Consumers that do not watch these channels may be better off to the extent that the payment reductions are passed through in the

113 For the channel-by-channel data, AT&T’s programming payments are lower than DIRECTV’s for approximately [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.].
form of lower video prices. However, consumers that lose channels they previously were able to enjoy would be worse off if the surplus gained from lower prices does not offset the surplus lost from a smaller selection of channels.

71. Similarly, the third factor leading to differences in programming payments – the ability to negotiate placing channels on higher service tiers – also results in an ambiguous consumer surplus impact. Holding prices fixed, consumers that must subscribe to higher tiers to receive channels that they previously received on lower tiers may be made worse off. However, consumers that already subscribed to higher tiers (or that have no interest in channels moved to higher tiers) likely will be better off if the reduced payments result in lower prices.

72. The results presented in Table 1 suggest that the difference in programming payments with quality held constant are likely lower (but no larger) than those claimed by the Applicants. At one extreme, if no consumers are assumed to be harmed if AT&T chooses to drop or move channels to higher service tiers, the quality-constant reduction in programming payments may be up to [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent, assuming AT&T can close the full gap between the payments of the two providers. We note, however, that this difference is still lower than the current [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent difference that AT&T claims in its filings.

73. At the other extreme, if only the payment reductions that result in an unambiguous increase in consumer surplus are considered in the merger simulation (that is, if we completely exclude any reductions AT&T could receive by dropping or retiering channels and consider only the individual differences in prices of channels that are offered by all three MVPDs), the quality-constant payment reductions would likely be significantly smaller, as they are estimated to be only [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent in the channel-by-channel data submitted by the Applicants. This can be seen by comparing rows 3 and 4 in Table 1, which shows the estimated difference between AT&T’s current payments for the [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] matched channels and AT&T’s hypothetical programming payments if it paid DIRECTV’s per-channel fees (while excluding the reductions that may arise from adjusting channel tiering).

74. The record in this proceeding provides no evidence quantifying the extent of consumer harms from potential lineup changes, and the Applicants do not provide any evidence that they would be able to achieve the full amount of payment reductions without adjusting their channel lineups. It is possible that a large number of subscribers would not perceive any difference in video service quality if AT&T drops or retiers channels, especially if the subscribers do not watch these affected channels anyway. These subscribers would likely benefit from the payment reductions AT&T achieves through adjusting their channel lineups. Yet some subscribers may perceive large quality changes if channels that they currently enjoy are dropped or moved to higher-priced tiers. The consumer surplus harms to these consumers would need to be subtracted from the consumer surplus gains that are derived from pass-through of reduced programming payments. Because we are unable to determine the changes that the merged entity may make in terms of tiers and channels for both AT&T and DIRECTV subscribers let alone the number of subscribers that would be harmed by such potential changes, we are unable to determine the exact reduction in programming payments that can be considered “quality-constant” reductions as required by the merger simulation.

75. We conclude that it is reasonable to assume that the quality-constant reduction in post-merger programming payments that AT&T could achieve if it could be folded under DIRECTV contracts is likely to lie somewhere between [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent and [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent of AT&T’s current payments. In the BH Simulation, the programming payment reduction is modeled as a flat [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] percent reduction in the marginal
costs of the AT&T video component. This reduction represents approximately percent of the marginal costs attributable to programming payments in the model. Given that we find a similar percent difference in the per-subscriber costs of the two firms when considering all channels, we continue to report the results under a programming payment reduction in our analysis. This value can be viewed as an upper bound of the potential quality-constant payment reductions AT&T could achieve post-transaction, which would be the case if it is assumed that no consumers would be harmed from future changes in AT&T’s channel tiering. Further, is the appropriate programming payment reduction for comparison of our analysis with the analysis submitted by the Applicants.

76. We also report the results under the assumption of a reduction in programming payments, which represents a likely lower bound of the potential quality-constant payment reduction (for purposes of the merger simulation). This lower bound is estimated by crediting only the difference between AT&T’s current per-subscriber payments and the per-subscriber payments it would receive if it were able to receive DIRECTV’s per-channel prices, but excluding payment reductions that would be achieved by dropping or retiering channels. We estimate this difference to be approximately percent, which is about half of the full percent difference seen between AT&T and DIRECTV payments in rows 1 and 2 of the table. Therefore, we use half of the full marginal cost reduction that is in the BH Simulation to represent the minimum reduction that we feel that AT&T might receive if it obtained DIRECTV’s fees and held its subscriber shares fixed.

77. Last, we report the results for no reduction in programming payments for purposes of comparison with the results reported by the Applicants using the BH Simulation, which was also

---

114 See Berry-Haile Analysis at 109. Additionally, AT&T’s video marginal cost in the BH Simulation is calculated to be approximately per subscriber. In the AT&T Financial Investment Model (“FIM”), the Applicants assume that payments to programmers for content comprise approximately percent of recurring video expenses. See Katz Additional Detail ¶ 50, nn.49-51. If we apply this same percent factor to marginal costs in the merger simulation, the percent reduction in marginal costs equates to approximately a reduction in marginal costs, which is higher than the percent reduction that the Applicants assumed. We ran the Modified Simulation under this higher marginal cost reduction and obtained results that are very similar to the ones that we report in Section V for the reduction. The main difference is that estimated consumer benefits are greater under the more generous reduction in marginal cost.

115 We note that, under the Modified Simulation, the estimated marginal cost for AT&T’s video component is higher than it is under the Corrected Simulation. A reduction of percent in the estimate of AT&T’s per-subscriber programming costs under the Modified Simulation translates to a marginal cost reduction of , which is higher than the reduction of that the Applicants assumed. We ran the Modified Simulation under this higher marginal cost reduction and obtained results that are very similar to the ones that we report in Section V for the reduction. The main difference is that estimated consumer benefits are greater under the more generous reduction in marginal cost.

116 This calculation implicitly assumes that, for the unmatched channels that AT&T offers but that do not match with the channels of the other two providers, AT&T is able to achieve the same average percentage reduction in its payments as it does for the 194 matched channels.
performed for the case of no reduction in programming payments.\textsuperscript{117} For brevity, we will refer to the three cases of no programming payment reductions, [BEGIN HIGHLY CONF. INFO.]\textsuperscript{END HIGHLY CONF. INFO.] programming payment reductions, and [BEGIN HIGHLY CONF. INFO.]\textsuperscript{END HIGHLY CONF. INFO.] programming payment reductions as “No PPR,” “Low PPR,” and “High PPR,” respectively.

V. RESULTS

78. In this section, we report the results of the Corrected Simulation and the Modified Simulation, each under No PPR, Low PPR, and High PPR (as defined in paragraph 77). We first report estimates of changes in the aggregate level of consumer surplus that are generated by the transaction,\textsuperscript{118} followed by estimates of changes in prices and shares for a subset of products. We then analyze how consumer surplus levels in individual DMAs are affected by the transaction, and finally we report the results of a number of robustness checks we performed to check the sensitivity of the results to certain assumptions and data quality.

A. Consumer Surplus Effects

79. Tables 2 and 3 report the consumer surplus effects of various iterations of the merger simulation for the Corrected Simulation and Modified Simulation, respectively.\textsuperscript{119} The results from the

\textsuperscript{117} Reporting this value is not meant to suggest that this is the result we expect to see post-transaction.

\textsuperscript{118} The change in consumer surplus can be viewed as the additional amount of money that each consumer would have to pay each month following the merger to make him or her indifferent between the merger occurring and not occurring. Thus, a positive change in consumer surplus – which implies that each consumer would be indifferent between the status quo and a post-merger world in which he or she has to pay an additional positive amount – indicates that the merger leads to an increase in consumer welfare. Conversely, a negative change in consumer surplus indicates that the merger is detrimental to consumer welfare. As the change in consumer surplus increases in magnitude, so does the change in consumer welfare.

\textsuperscript{119} In discrete choice settings, consumer surplus is the expected utility, in monetary terms, that a representative consumer obtains from the choice situation. See, e.g., TRAIN (2009). In the nested logit demand model used here, a representative consumer’s utility from consuming a product $j \in \{L_{n=1}\}$ is given by $U_j = \beta x_j - \alpha p_j + \xi_j$ where $x_j$ is a vector of product characteristics, $p_j$ is the product’s price, $\xi_j$ is a random variable that represents an idiosyncratic component of utility that is unobserved by the econometrician, and $\beta$ and $\alpha$ are exogenous parameters that are estimated from choice data. (Note that $\alpha$ represents the marginal utility that the consumer obtains from holding money.) The random vector $(\xi_j, \ldots, \xi_j)$ is distributed according to the cumulative distribution function given by:

$$F(\xi_j, \ldots, \xi_j) = \exp \left( - \sum_{g=1}^G \left[ \sum_{j=1}^{n_g} \exp \left( \frac{U_j - \theta_g}{1 - \theta_g} \right) \right] / \theta_g \right),$$

where $\{L_{n=1}\}$, the set of nests, is a partition of the product set $\{L_{n=1}\}$, $n_g$ is a tuple of exogenous nesting parameters (which are estimated from choice data and dictate substitution patterns among products), and $\theta_g = \lim_{n \to \infty} n \log(n) \approx 0.577$ is Euler’s constant. Under this setup, consumer surplus is defined as:

$$C = \frac{\sum_{j=1}^J U_j}{\alpha}$$

A general result due to Daniel McFadden, Modelling the Choice of Residential Location, in SPATIAL INTERACTION THEORY AND PLANNING MODELS (A. Karlqvist, L. Lundqvist, F. Snickars & J. Weibull eds., 1978) implies that expected utility (and, by extension, consumer surplus) in this model has a simple closed-form expression:

(continued….)
Corrected Simulation are computed using the data supplied by the Applicants but based on the correction of a coding error in the Applicants’ recentering procedure. We report the results from the Corrected Simulation to provide a baseline with which to compare our results in our Modified Simulation, as they differ from the results presented by the Applicants in the BH Simulation. The consumer surplus changes are reported as weighted averages over the DMA-level results for the 85 DMAs that are included in the merger simulation.

80. The first row of Table 2 shows that, in the Corrected Simulation, relative to the pre-merger world, and under No PPR, the merger of AT&T and DIRECTV reduces consumer surplus by $0.12 per household per month. This is equivalent to an increase in industry-wide prices of slightly less than $0.12. The effect of reductions in programming payments is considered in the second and third rows of Table 2. If the transaction results in a reduction in programming payments (i.e., Low PPR), the simulated outcome implies a consumer surplus gain of $0.30 per household per month. Naturally, under a larger reduction in AT&T’s programming payments (i.e., High PPR), the simulated outcome entails a larger $0.77 increase in consumer surplus per household.

81. As described earlier, the net consumer surplus effect can be decomposed into three elements: (1) a reduction in horizontal competition; (2) pass-through from reduced programming payments; and (3) a dividend from bundling. The last three rows of Table 2 present results from decomposing these three elements. This analysis uses a model (referred to here as the “Horizontal Effects Simulation”), which we developed, in which the marginal impact of AT&T’s video service being merged with DIRECTV is evaluated relative to a hypothetical baseline in which AT&T video is a standalone business. This hypothetical AT&T-DIRECTV video-only merger is an indicative measure of the purely

(Continued from previous page)

\[ E_{\text{max}, j, i, \theta} = \log \left( \sum_{x=0}^{b} \sum_{y_{i}} \exp \left( \frac{P_{x,j} - P_{y,j}}{1 - \psi} \right) \right)^{\theta - \psi} \]

120 There is a tradeoff, which results in the equivalent industry-wide price change being slightly less than the change in consumer surplus. On one hand, an increase in price will induce some consumers to exit the market entirely. (This effect pushes the equivalent price change to be slightly greater than the consumer surplus change, because consumers will leave the market if, by doing so, they can limit their losses to be less than $0.12). On the other hand, the presence of synthetic bundles works to oppose this effect. This point is best demonstrated via an example. For a consumer that buys a synthetic bundle pre-merger and continues to buy it post-merger, the effect of a $0.12 across-the-board price increase on her consumer surplus will be -$0.24; that is, the consumer surplus-equivalent price increase on any one component is lower in magnitude than the consumer surplus decrease. The latter effect dominates in the estimated model.

121 The Horizontal Effects Simulation assumes an initial spinoff of AT&T’s U-verse video from the rest of AT&T. This new entity provides only video service and sets its own price, which is formally independent of the price of AT&T broadband service set by the original company (in the sense that the new entity does not take into account the effects of its pricing decision on the profit generated by AT&T’s broadband component). In the first stage of the simulation, firms and consumers respond to this divestiture until a new equilibrium of prices and market shares is established. In the second stage, the new entity merges with DIRECTV in a purely horizontal merger of two competing video components. The welfare effects of this merger are calculated relative to the post-spinoff world, which differs considerably in market structure from the pre-merger world of the original simulation. A direct comparison of the consumer surplus effects between the baseline and Horizontal Effects Simulations (using either the Corrected Simulation or the Modified Simulation) is therefore difficult. The results of the Horizontal Effects Simulation are nevertheless indicative of the relative magnitude of the harms from a reduction in video competition compared to the benefits of bundling observed in the relevant baseline simulation.
horizonal competitive impact of the overall transaction. The Horizontal Effects Simulation is run under the demand model used in the Corrected Simulation as well as the one used in the Modified Simulation.

Table 2: Consumer Surplus Effects: Corrected Simulation

<table>
<thead>
<tr>
<th>Assumption</th>
<th>Consumer surplus change ($/household/month)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No PPR</td>
<td>-0.12</td>
</tr>
<tr>
<td>Low PPR</td>
<td>0.30</td>
</tr>
<tr>
<td>High PPR</td>
<td>0.77</td>
</tr>
<tr>
<td>Horizontal Effects: No PPR</td>
<td>-0.49</td>
</tr>
<tr>
<td>Horizontal Effects: Low PPR</td>
<td>-0.22</td>
</tr>
<tr>
<td>Horizontal Effects: High PPR</td>
<td>0.07</td>
</tr>
</tbody>
</table>

No PPR: no reduction in programming payments for AT&T video
Low PPR: [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] reduction in programming payments for AT&T video
High PPR: [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] reduction in programming payments for AT&T video

82. Table 3 is analogous to Table 2, except that it shows the estimated consumer surplus effects under the Modified Simulation. In this case, the merger has a negligible consumer surplus effect under No PPR ($0.02 per household per month) but substantial positive effects under Low PPR ($0.51) and High PPR ($1.11). The Horizontal Effects Simulation returns a reduction in consumer surplus of $0.29 per household per month under No PPR and gains of $0.16 and $0.64 per household per month under Low PPR and High PPR, respectively.123

Table 3: Consumer Surplus Effects: Modified Simulation

<table>
<thead>
<tr>
<th>Assumption</th>
<th>Consumer surplus change ($/household/month)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No PPR</td>
<td>0.02</td>
</tr>
<tr>
<td>Low PPR</td>
<td>0.51</td>
</tr>
<tr>
<td>High PPR</td>
<td>1.11</td>
</tr>
<tr>
<td>Horizontal Effects: No PPR</td>
<td>-0.29</td>
</tr>
<tr>
<td>Horizontal Effects: Low PPR</td>
<td>0.16</td>
</tr>
</tbody>
</table>

122 We do not report standard errors or confidence intervals for these estimated welfare effects, because, although we have computed standard errors for the estimated demand model parameters, the estimated marginal costs and optimal post-merger prices cannot be written as closed-form functions of the demand model parameters. This limitation prevents us from obtaining the consumer surplus point estimates and standard errors analytically based on the demand model parameters; indeed, the firms’ marginal costs and post-merger outcomes are obtained computationally. Monte Carlo methods provide one way to obtain standard errors or confidence intervals for the estimated consumer surplus effects based on the demand parameter estimates; in particular, one could determine a distribution of consumer surplus changes by repeatedly sampling from a multivariate distribution that is based upon the estimated demand model parameters and running the merger simulation for each draw of parameters from the distribution. The Applicants attempted such an exercise with the BH Simulation but found that the standard errors associated with the parameter estimates were too large to generate a representative sample of draws that are consistent with the nested logit demand model. See Berry-Haile Additional Discussion at 41-44.

123 That is, the marginal effect of a loss of a video competitor is unambiguously detrimental to consumer welfare. However, a reduction in the cost of providing service (in the form of either Low PPR or High PPR) more than compensates for the harm created by the reduction in competition.
Horizontal Effects: High PPR  
0.64

No PPR: no reduction in programming payments for AT&T video

Low PPR: [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] reduction in programming payments for AT&T video

High PPR: [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] reduction in programming payments for AT&T video

83. We can compare the original Modified Simulation against the Horizontal Effects Simulation to explore the benefits of bundling. Though the exact size of the bundling effect is difficult to ascertain, as the baseline off of which consumer surplus is calculated differs between the original Modified Simulation and the Horizontal Effects Simulation, the difference in magnitude between the two simulations’ consumer welfare effects is still indicative of the transaction’s potential bundling benefits. In addition, examining the difference in consumer surplus in Table 3 between original and horizontal effects (0.02 – [-0.29] = 0.31) under No PPR against the analogous difference under High PPR (1.11 – 0.64 = 0.47) suggests that bundling becomes even more salient in the presence of programming payment reductions.

84. We also observe, from Table 3, that the marginal welfare effect of High PPR for the actual merger is $1.09 (1.11 – 0.02), while the marginal effect of High PPR in the hypothetical purely horizontal merger is $0.93 (0.64 – [-0.29]). This finding suggests that programming payment reductions increase consumer surplus by passing through the reduction in marginal cost of the standalone AT&T video product to consumers, as well as by reducing the cost of the integrated bundle that includes AT&T video as a component.124

B. Price and Share Effects

85. In Table 4 below, the price changes of selected products – namely, the Applicants’ products and the cable bundle, which is the largest competing product – are reported under the Corrected Simulation under the assumption of No PPR (i.e., the case considered in the top row of Table 2). These quoted prices are monthly per-subscriber prices in dollars. Because of price recentering, the prices are those used in the Corrected Simulation rather than the actual prices charged by the firms. The meaningful measures are the changes reported in dollar amounts and changes in the percentages of households purchasing a particular product. Percentage price changes are reported but are informative only to the extent that the simulation price levels roughly correspond to notional real marketplace prices. They should be viewed as only somewhat indicative at best.

86. In the No PPR case, the prices of AT&T’s standalone video service, DIRECTV’s standalone video service, and the AT&T integrated bundle are all predicted to rise. These effects are all illustrative of the merger’s potential horizontal harm, which was quantified above through the use of the Horizontal Effects Simulation. The price of the newly integrated AT&T-DIRECTV bundle, however, falls due to the fact that the combined firm internalizes the externality that the price of each component of that bundle exerts on the profit earned from sales of the other component.

124 This second cost reduction is not captured in the purely horizontal merger; therefore, the total welfare effect of a reduction in programming payments is somewhat lower.
Table 4: Selected Price Changes under No PPR: Corrected Simulation

[BEGIN HIGHLY CONF. INFO.]

[END HIGHLY CONF. INFO.]

Table 5 shows the price changes and market effects under Low PPR in the Corrected Simulation for the same products as shown in the previous table. This case corresponds to the second row of Table 2. The AT&T video only price drops by $0.66 relative to the pre-merger price. However, the price drops by $6.41 (i.e., from $81.73 to $75.32) between the post-merger scenario under No PPR and the post-merger scenario under Low PPR, implying a pass-through of reduced costs to consumers that is higher than the percent pass-through in the BH Simulation.  

Table 5: Selected Price Changes under Low PPR: Corrected Simulation

[BEGIN HIGHLY CONF. INFO.]

[END HIGHLY CONF. INFO.]

Table 6 shows the price changes and market effects under High PPR. This case corresponds to the third row of Table 2. Again, the AT&T video only price is assumed to drop by $12.47 relative to the post-transaction scenario with no cost reductions, once again implying a pass-through of percent.

Table 6: Selected Price Changes under High PPR: Corrected Simulation

[BEGIN HIGHLY CONF. INFO.]

[END HIGHLY CONF. INFO.]

Table 7, Table 8, and Table 9 are exactly analogous to Table 4, Table 5, and Table 6 (respectively), except that they show the results from the Modified Simulation, which employs actual third-party pricing data.

---

125 See AT&T and DIRECTV, White Paper, Content Cost Savings Will Result in Both Improved Profitability and Pass Through to Consumers, at 8, transmitted by letter from Maureen R. Jeffreys, Counsel for AT&T, to Marlene H. Dortch, Secretary, FCC, MB Docket No. 14-90 (filed Nov. 12, 2014). The pass-through is defined as the ratio of the price change to the change in marginal cost. As shown by Luke Froeb, Steven Tschantz & Gregory J. Werden, Pass-Through Rates and the Price Effects of Mergers, 23 INT’L J. OF INDUSTRIAL ORG. 703, 703-715 (2005), high estimates of pass-through rates often accompany high estimates of horizontal harm from mergers, because both are closely related to the concavity of the demand function. [BEGIN HIGHLY CONF. INFO.][END HIGHLY CONF. INFO.]
90. The results of the Modified Simulation indicated that the transaction likely would result in downward pressure on the prices of AT&T-DIRECTV broadband and video bundles and, to a lesser extent, on the prices of cable bundles. The price of the AT&T-DIRECTV bundle decreases by $2.74 with no programming payment reductions and decreases by $2.20 and $1.38 for programming payment reductions of [BEGIN HIGHLY CONF. INFO.] and [BEGIN HIGHLY CONF. INFO.] respectively. The price of the AT&T U-verse bundle increases by $1.31 with no programming payment reductions and decreases by $2.93 and $6.70 in the Low PPR and High PPR simulations, respectively. For the cable bundle, the price decreases by $0.08 with no programming payment reductions and decreases by $0.52 and $0.66 in the Low PPR and High PPR simulations, respectively.

91. The directions of the price changes of the merging-parties’ bundles do not differ between the Corrected Simulation and the Modified Simulation, but the magnitudes are notably lower in the Modified Simulation for the AT&T-DIRECTV bundle and larger for the AT&T-AT&T bundle. However, the size of the price drop for the cable bundle is larger in the Modified Simulation than in the Corrected Simulation.

92. A comparison of Table 7 with Table 8 also shows that the post-merger price of the AT&T-DIRECTV integrated bundle is higher in the Low PPR case than in the No PPR case (although it still falls from its pre-merger level). To understand the reason behind this effect, it is helpful to temporarily view the No PPR case as a post-transaction baseline and the Low PPR case as the result of an exogenous reduction in AT&T’s cost of providing video service relative to its post-transaction baseline level (i.e., relative to the post-transaction cost of AT&T’s video service under No PPR). All else being equal, this reduction in programming payments leads AT&T to reduce the prices of AT&T video products – including the AT&T-AT&T bundle – which, in turn, will induce some consumers that reside in DMAs in which AT&T offers video service to switch from the AT&T-DIRECTV bundle to the AT&T-AT&T bundle. The consumers that switch away from the AT&T-DIRECTV bundle are likely those that, in the No PPR case, were nearly indifferent between the AT&T-DIRECTV bundle and some other product (possibly, but not necessarily, the AT&T-AT&T bundle) but had a slight preference for the AT&T-DIRECTV bundle. Because, after the price reduction, these nearly indifferent consumers are no longer purchasing the AT&T-DIRECTV bundle, the demand for the AT&T-DIRECTV bundle has become less elastic at its baseline price level in DMAs in which AT&T offers video service. Thus, the firm can profit by slightly raising the AT&T-DIRECTV bundle’s price from its baseline level in these DMAs. The price increase in these DMAs leads to an increase in the average price across all DMAs, which is reported in the tables above.

93. As the above discussion illustrates, the transaction allows the combined entity to partially “recapture” the profit lost from those subscribers that are diverted away from DIRECTV products after the price increase, as some of them will likely subscribe to the now lower-priced AT&T video products. The results of the Modified Simulation indicate that the increased margins on those customers that continue to purchase the higher-priced DIRECTV video products and the increased margins on those customers that purchase the lower-cost AT&T video products (due to [BEGIN HIGHLY CONF. INFO.] percent pass-through) together outweigh the loss in profit from those that leave the DIRECTV video products.¹²⁷

¹²⁶ Note, however, that the cost of providing DIRECTV’s video service does not change.

¹²⁷ While we have provided an intuitive explanation for the increase in the price of the AT&T-DIRECTV bundle as a result of PPRs, we note that the pricing incentives in the oligopoly pricing game of this environment are fairly complex, which is reflected in our use of computational techniques in obtaining solutions. The challenges in obtaining analytic solutions, even in the simpler monopolistic screening framework, are demonstrated by, for (continued….)
94. The prices of standalone AT&T and DIRECTV video products are slightly higher after the transaction in the Modified Simulation with No PPR. As programming payment reductions are introduced, the price of standalone DIRECTV video tends to increase slightly, while the price of standalone AT&T video falls substantially. The Modified Simulation exhibits a pass-through rate of programming payment reductions of about [BEGIN HIGHLY CONF. INFO.] percent, which is similar to the [END HIGHLY CONF. INFO.] percent pass-through of the BH Simulation but [BEGIN HIGHLY CONF. INFO.] percent pass-through in the Corrected Simulation than the pass-through found in the Corrected Simulation.

Table 7: Selected Price Changes under No PPR: Modified Simulation

[BEGIN HIGHLY CONF. INFO.]

[END HIGHLY CONF. INFO.]

Table 8: Selected Price Changes under Low PPR: Modified Simulation

[BEGIN HIGHLY CONF. INFO.]

[END HIGHLY CONF. INFO.]

Table 9: Selected Price Changes under High PPR: Modified Simulation

[BEGIN HIGHLY CONF. INFO.]

[END HIGHLY CONF. INFO.]

C. DMA Specific Effects

95. In this section, we examine the merger’s effects, as predicted by the Modified Simulation, on individual DMAs. Specifically, we consider the disaggregated results to analyze whether any DMAs are disproportionately harmed by the transaction.

96. We first discuss the market-level welfare effects of the merger under the different PPR assumptions, focusing primarily on the price changes of the merging parties’ products. We then examine DMAs where AT&T has deployed U-verse video to determine whether the degree of U-verse penetration is correlated with post-merger outcomes. Finally, we present heat maps as a visual guide to the differing cross-DMA effects of the merger.

1. Market-Level Welfare Effects

97. Table 10 presents the minimum, maximum, and quartiles of the consumer surplus changes predicted by the merger simulation across DMAs. Without reductions in programming payments, 18 DMAs face a reduction in consumer surplus greater than $0.10 per household per month

relative to the pre-merger status quo. When we assume Low PPRs or High PPRs, no markets experience a reduction in consumer surplus greater than $0.05. Markets with the highest amount of AT&T U-verse coverage benefit the most from the reduction in programming payments, as the higher availability of U-verse increases the impact of programming payment reduction pass-through. Under High PPR, the median DMA sees an increase in consumer surplus of $0.79 per household per month, which is below the household weighted average change across DMAs of $1.11 that is reported in Table 3 (and is also below an unweighted average across DMAs, which yields a consumer surplus of $0.90), indicating that there are a number of larger DMAs within the U-verse footprint that benefit disproportionately.

**Table 10: Consumer Surplus Effects across DMAs: Modified Simulation**

<table>
<thead>
<tr>
<th>Assumption</th>
<th>Consumer surplus change ($/household/month)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min</td>
</tr>
<tr>
<td>No PPR</td>
<td>-0.43</td>
</tr>
<tr>
<td>Low PPR</td>
<td>-0.04</td>
</tr>
<tr>
<td>High PPR</td>
<td>-0.04</td>
</tr>
</tbody>
</table>

No PPR: no reduction in programming payments for AT&T video  
Low PPR: [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] reduction in programming payments for AT&T video  
High PPR: [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] reduction in programming payments for AT&T video

98. Table 11 and Table 12 report the price and share changes (respectively) across DMAs associated with the consumer surplus changes reported in the first row of Table 10, which corresponds to the case of No PPR. Price changes are reported in dollars per subscriber per month, while share changes are reported as percentage points.

99. Under No PPR, AT&T’s integrated bundle experiences a significant price increase in every DMA, with the smallest increase totaling $0.53 per month. Likewise, there are large price increases for AT&T’s and DIRECTV’s standalone video components in most DMAs. However, the reduction in consumer surplus from an increase in the price of AT&T’s video component is mitigated by its small share. All DMAs experience substantial price reductions (of at least $1.07 per month) for the newly integrated AT&T-DIRECTV bundle relative to the synthetic bundle that is available before the merger.

---

128 Though no margin of error is provided for the consumer surplus estimates, changes in consumer surplus below $0.10 are likely to be small in economic magnitude relative to pre-merger prices.

129 For AT&T’s integrated bundle as well as its standalone video component, Table 11 and Table 12 report statistics across only those DMAs in which AT&T video is available; they exclude the zero price and share changes reported by the model outside of the U-verse footprint.
Table 11: Selected Price Changes across DMAs under No PPR: Modified Simulation

<table>
<thead>
<tr>
<th>Video</th>
<th>Broadband</th>
<th>Min</th>
<th>Max</th>
<th>25th percentile</th>
<th>50th percentile</th>
<th>75th percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIRECTV</td>
<td>AT&amp;T</td>
<td>-5.66</td>
<td>-1.07</td>
<td>-3.01</td>
<td>-2.70</td>
<td>-2.40</td>
</tr>
<tr>
<td>DIRECTV</td>
<td>None</td>
<td>-0.08</td>
<td>2.42</td>
<td>0.14</td>
<td>0.58</td>
<td>1.04</td>
</tr>
<tr>
<td>Cable</td>
<td>Cable</td>
<td>-1.12</td>
<td>0.25</td>
<td>-0.17</td>
<td>-0.07</td>
<td>0.01</td>
</tr>
<tr>
<td>AT&amp;T</td>
<td>AT&amp;T</td>
<td>0.53</td>
<td>2.52</td>
<td>1.03</td>
<td>1.33</td>
<td>1.62</td>
</tr>
<tr>
<td>AT&amp;T</td>
<td>None</td>
<td>0.58</td>
<td>3.06</td>
<td>1.27</td>
<td>1.53</td>
<td>2.03</td>
</tr>
<tr>
<td>None</td>
<td>AT&amp;T</td>
<td>-1.41</td>
<td>1.08</td>
<td>-0.36</td>
<td>-0.11</td>
<td>0.11</td>
</tr>
</tbody>
</table>

No PPR: no reduction in programming payments for AT&T video

Table 12: Selected Share Changes across DMAs under No PPR: Modified Simulation

[BEGIN HIGHLY CONF. INFO.]

[END HIGHLY CONF. INFO.]

100. Though not reported here, under Low PPR and High PPR, the post-merger price reduction on the AT&T-DIRECTV integrated bundle is smaller than under No PPR. In fact, eight DMAs experience an increase in the new integrated bundle price under High PPR (compared to zero DMAs under No PPR). However, this reduction in the bundling effect for the merging parties is more than offset by the substantially larger decrease in the price of the cable bundle, as well as the large decrease in price of the AT&T bundle within the U-verse footprint. This also suggests that, while the introduction of an integrated AT&T-DIRECTV bundle, by itself, induces a small competitive response from cable companies, the potential reduction in AT&T’s programming payments magnifies this effect.¹³⁰

2. U-verse Household Penetration and Market Outcomes

101. Economic theory suggests that consumer harm from the horizontal aspect of the merger should be most pronounced in markets with higher U-verse video household penetration, as more product availability should lead to higher uptake and, therefore, to a larger negative impact of a price increase.¹³¹ However, Figure 1 below, which plots U-verse penetration against post-merger change in consumer surplus for all 85 DMAs, paints a more nuanced picture. Non-U-verse video markets (the points along the Y-axis where U-verse penetration is zero) do appear to benefit, but the overall DMA-level impact of the merger appears largely unrelated to U-verse penetration for DMAs within the U-verse footprint. Because the net welfare effect of the merger, both across and within DMAs, depends on the potential reduction in competition as well as on the gains from bundling, Figure 1 suggests either that the welfare loss from reduced competition is uncorrelated with U-verse penetration, or that the bundling effect also varies across DMAs.

¹³⁰ These results are also in line with our previous observation that bundling becomes more salient in the presence of programming payment reductions.

¹³¹ Indeed, the cross-market correlation between U-verse household penetration and market share of standalone U-verse video is 0.45, while the correlation between U-verse penetration and the U-verse bundle is 0.76.
Figure 1: Modified Simulation, No PPR: Consumer Surplus vs. U-verse Video Household Penetration

No PPR: no reduction in programming payments for AT&T video

102. In Figure 2, we repeat the above exercise for the Horizontal Effects Simulation and find that the harm from reduced video competition is in fact highly correlated with the degree of U-verse penetration. Taken together with Figure 1, this implies that the gains from bundling do vary systematically by DMA, and, in particular, that these gains are larger in DMAs with higher U-verse penetration.
Finally, in Figure 3, we plot consumer surplus versus U-verse penetration for the Modified Simulation under High PPR. The results are markedly different from the previous graphs: the largest beneficiaries of the programming payment reduction are now the markets with the highest U-verse penetration rates. As discussed above, this result is intuitive, because U-verse video needs to be widely available in a DMA in order for consumers to benefit from any pass-through of PPRs.\footnote{See supra ¶ 101.}
3. Maps of Main Simulation Results

We present maps of the continental United States showing changes in consumer surplus within a DMA under various settings for the Modified Simulation. These maps help summarize much of the discussion in this section. We also present a table of the most negatively affected DMAs under the same settings to accompany the maps.

Under the Modified Simulation with No PPR, the weighted average post-merger change in consumer surplus is essentially zero. Figure 4 shows that this result is being driven in nearly equal parts by DMAs that suffer small welfare losses and those that enjoy small welfare gains. Under Low PPR and High PPR, the consumer surplus change is positive, at $0.51 and $1.11 respectively. Figure 5 and Figure 6 show that the PPR filters through to all DMAs within the U-verse footprint. Finally, Figure 7 maps the horizontal effects across DMAs. Note that a total of 25 DMAs are outside of the U-verse footprint and thus unaffected by the reduction in competition analyzed in the Horizontal Effects Simulation. In Figure 7, these DMAs are shown in light blue and experience no changes in consumer surplus.
Figure 4: Modified Simulation, No PPR: Predicted Change in Consumer Surplus by DMA

No PPR: no reduction in programming payments for AT&T video

Figure 5: Modified Simulation, Low PPR: Predicted Change in Consumer Surplus by DMA

Low PPR: [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] reduction in programming payments for AT&T video
Figure 6: Modified Simulation, High PPR: Predicted Change in Consumer Surplus by DMA

High PPR: [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] reduction in programming payments for AT&T video

Figure 7: Modified Horizontal Effects Simulation, No PPR: Predicted Change in Consumer Surplus by DMA

No PPR: no reduction in programming payments for AT&T video

106. Table 13 lists the most harmed (or least benefited) DMAs under the various specifications analyzed. As previously indicated, non-U-verse markets do not benefit from a reduction in programming payments. Conversely, U-verse markets with high video penetration rates are harmed the most from the horizontal aspect of the merger.

133 Though Table 13 does not present results for the Low PPR case, the markets that benefit the least in that case are identical to the ones that benefit least under High PPR (which are reported in the table).
Table 13: Most Harmed Markets by Simulation Specification

### Modified Simulation - No PPR:

<table>
<thead>
<tr>
<th>State</th>
<th>Market ID</th>
<th>Market Name</th>
<th>CS Change</th>
<th>U-verse HH Penetration</th>
</tr>
</thead>
<tbody>
<tr>
<td>TX</td>
<td>618</td>
<td>HOUSTON</td>
<td>-0.43</td>
<td>0.70</td>
</tr>
<tr>
<td>AR</td>
<td>670</td>
<td>FT. SMITH-FAY-SPRNGDL-RGRS</td>
<td>-0.35</td>
<td>0.54</td>
</tr>
<tr>
<td>TX</td>
<td>635</td>
<td>AUSTIN</td>
<td>-0.31</td>
<td>0.71</td>
</tr>
<tr>
<td>OH</td>
<td>535</td>
<td>COLUMBUS, OH</td>
<td>-0.26</td>
<td>0.57</td>
</tr>
<tr>
<td>MO</td>
<td>616</td>
<td>KANSAS CITY</td>
<td>-0.24</td>
<td>0.73</td>
</tr>
<tr>
<td>IN</td>
<td>527</td>
<td>INDIANAPOLIS</td>
<td>-0.22</td>
<td>0.71</td>
</tr>
<tr>
<td>TX</td>
<td>623</td>
<td>DALLAS-FT. WORTH</td>
<td>-0.21</td>
<td>0.62</td>
</tr>
<tr>
<td>MO</td>
<td>609</td>
<td>ST. LOUIS</td>
<td>-0.20</td>
<td>0.67</td>
</tr>
<tr>
<td>AR</td>
<td>693</td>
<td>LITTLE ROCK-PINE BLUFF</td>
<td>-0.20</td>
<td>0.38</td>
</tr>
<tr>
<td>TX/NM</td>
<td>765</td>
<td>EL PASO (LAS CRUCES)</td>
<td>-0.20</td>
<td>0.51</td>
</tr>
</tbody>
</table>

### Modified Simulation - High PPR:

<table>
<thead>
<tr>
<th>State</th>
<th>Market ID</th>
<th>Market Name</th>
<th>CS Change</th>
<th>U-verse HH Penetration</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR</td>
<td>813</td>
<td>MEDFORD-KLAMATH FALLS</td>
<td>-0.04</td>
<td>0</td>
</tr>
<tr>
<td>IL</td>
<td>632</td>
<td>PADUCAH-CAPE GIRARD-HARSBG</td>
<td>-0.01</td>
<td>0</td>
</tr>
<tr>
<td>NV</td>
<td>839</td>
<td>LAS VEGAS</td>
<td>-0.01</td>
<td>0</td>
</tr>
<tr>
<td>MO</td>
<td>604</td>
<td>COLUMBIA-JEFFERSON CITY</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>WI</td>
<td>705</td>
<td>WAUSAU-RHINELANDER</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>NE</td>
<td>722</td>
<td>LINCOLN &amp; HASTINGS-KRNY</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>UT</td>
<td>770</td>
<td>SALT LAKE CITY</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>IN</td>
<td>509</td>
<td>FT. WAYNE</td>
<td>0.01</td>
<td>0</td>
</tr>
<tr>
<td>WI</td>
<td>676</td>
<td>DULUTH-SUPERIOR</td>
<td>0.01</td>
<td>0</td>
</tr>
<tr>
<td>FL</td>
<td>539</td>
<td>TAMPA-ST. PETE (SARASOTA)</td>
<td>0.02</td>
<td>0</td>
</tr>
</tbody>
</table>

### Horizontal Effects Simulation - No PPR:

<table>
<thead>
<tr>
<th>State</th>
<th>Market ID</th>
<th>Market Name</th>
<th>CS Change</th>
<th>U-verse HH Penetration</th>
</tr>
</thead>
<tbody>
<tr>
<td>TX</td>
<td>618</td>
<td>HOUSTON</td>
<td>-0.70</td>
<td>0.70</td>
</tr>
<tr>
<td>AL</td>
<td>630</td>
<td>BIRMINGHAM (ANN AND TUSC)</td>
<td>-0.67</td>
<td>0.71</td>
</tr>
<tr>
<td>GA</td>
<td>524</td>
<td>ATLANTA</td>
<td>-0.60</td>
<td>0.84</td>
</tr>
<tr>
<td>NV</td>
<td>811</td>
<td>RENO</td>
<td>-0.57</td>
<td>0.56</td>
</tr>
<tr>
<td>TX</td>
<td>623</td>
<td>DALLAS-FT. WORTH</td>
<td>-0.55</td>
<td>0.62</td>
</tr>
<tr>
<td>MO</td>
<td>609</td>
<td>ST. LOUIS</td>
<td>-0.54</td>
<td>0.67</td>
</tr>
<tr>
<td>CA</td>
<td>862</td>
<td>SACRAMNTO-STKTON-MODESTO</td>
<td>-0.52</td>
<td>0.68</td>
</tr>
<tr>
<td>FL</td>
<td>686</td>
<td>MOBILE-PENSACOLA (FT WALT)</td>
<td>-0.50</td>
<td>0.56</td>
</tr>
<tr>
<td>CA</td>
<td>825</td>
<td>SAN DIEGO</td>
<td>-0.50</td>
<td>0.94</td>
</tr>
<tr>
<td>IN</td>
<td>527</td>
<td>INDIANAPOLIS</td>
<td>-0.49</td>
<td>0.71</td>
</tr>
</tbody>
</table>

No PPR: no reduction in programming payments for AT&T video
High PPR: [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] reduction in programming payments for AT&T video

107. The DMA-specific analysis in this section suggests that the proposed merger would likely reduce video competition inside of the U-verse video footprint and, in particular, in DMAs where U-verse reaches a large proportion of TV households. The net welfare loss from these harms is generally balanced against the welfare gains from a more competitive AT&T-DIRECTV integrated bundle, though a non-
trivial number of DMAs do experience small reductions in consumer surplus. Under High PPR, the Modified Simulation predicts significant welfare gains for all DMAs within the U-verse video footprint. These gains outweigh the horizontal harms. The Horizontal Effects Simulation likewise predicts a non-trivial increase in consumer surplus when incorporating PPRs. Given that the benefits of bundling are even stronger when PPRs are introduced into the simulation, the predicted effect of the merger across DMAs depends largely on the magnitude of the realized PPR.

D. Robustness: Outliers and Price Winsorization

108. As noted previously, the AT&T and DIRECTV subscriber price data that is fed into the simulations shows a very high degree of variability within each plan, including extreme values. To help determine if the results were being driven by the presence of extreme values, two robustness checks – both involving winsorization, a form of data censoring in which extreme values below a predetermined lower bound are replaced with the lower bound and extreme values above a predetermined upper bound are replaced with the upper bound – were performed. In the first robustness check, prices across all plan types were winsorized using the first and 99th percentile values as the lower and upper bounds, respectively. The second robustness check was motivated by the concern that censoring prices may affect bundled plans (which are, on average, more expensive than video-only and broadband-only plans) disproportionately; thus, in the second robustness check, prices within each nest (video-only plans, broadband-only plans, and bundles) were winsorized using the nest's first and 99th percentile values. In both robustness checks, all other simulation processes were left unchanged. We refer to the simulations performed under these two robustness checks as “Winsorized” and “Nest-Winsorized,” respectively.

109. As shown in Table 14, we find that the simulation results are sensitive to alterations in the underlying pricing data. In the Corrected Simulation, consumer surplus is slightly negative, at -$0.12 under No PPR, and positive, at $0.77, under High PPR. Compared to this baseline, winsorizing over plan types improves consumer surplus post-merger. Consumer surplus rises to $0.15 under No PPR and to $0.97 under High PPR. Winsorization within product nests does not qualitatively change the results, as consumer surplus increases slightly to $0.20 and $1.01, under No PPR and High PPR, respectively.

Table 14: Consumer Surplus Estimates with Price Winsorization

<table>
<thead>
<tr>
<th>Simulation and Data</th>
<th>Consumer surplus change ($/household/month), No PPR</th>
<th>Consumer surplus change ($/household/month), High PPR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Simulation - Original</td>
<td>-0.12</td>
<td>0.77</td>
</tr>
<tr>
<td>Corrected Simulation - Winsorized</td>
<td>0.15</td>
<td>0.97</td>
</tr>
<tr>
<td>Corrected Simulation - Nest-Winsorized</td>
<td>0.20</td>
<td>1.01</td>
</tr>
<tr>
<td>Modified Simulation - Original</td>
<td>0.02</td>
<td>1.11</td>
</tr>
<tr>
<td>Modified Simulation - Winsorized</td>
<td>0.67</td>
<td>1.47</td>
</tr>
<tr>
<td>Modified Simulation - Nest-Winsorized</td>
<td>0.56</td>
<td>1.38</td>
</tr>
</tbody>
</table>

No PPR: no reduction in programming payments for AT&T video
High PPR: [BEGIN HIGHLY CONF. INFO.] [END HIGHLY CONF. INFO.] reduction in programming payments for AT&T video

110. We also performed the price-winsorization robustness checks in the Modified Simulation. Running the same analysis using the updated third-party pricing data in the Modified Simulation, we find

134 We also investigated simply dropping (omitting) the extreme observations. This was found to interact with the data handling structures employed by the simulation code in problematic ways, leading to computational and convergence challenges.
that the results continue to be sensitive to the underlying data. Recall that, under the Modified Simulation, consumers are more price-sensitive than in the Corrected Simulation. When prices are winsorized across all plan types, consumer surplus rises to $0.67 and $1.47 under No PPR and High PPR, respectively. Winsorization within product nests slightly dampens the increase in overall consumer surplus. We find that consumer surplus falls to $0.56 and $1.38 under No PPR and High PPR, respectively.

E. Robustness: Appropriate Setting of the Pre-Merger Synthetic Bundle Discount

111. The BH Simulation compares post-merger outcomes against the status quo and includes fixed price discounts that are offered on synthetic bundles that combine DIRECTV video service with broadband service offered by AT&T, Telco providers, and one Cable provider. (Each discount is borne equally by both of the firms whose components compose the associated bundle.) These discounts are exogenous, and, in principle, it is possible that an alternative discount level exists for the synthetic bundle of DIRECTV video service and AT&T broadband service that would increase the merging parties’ individual pre-merger profits while also enhancing consumer surplus. In this case, one might argue that a counterfactual scenario, in which the parties remain unmerged but coordinate in modifying their synthetic bundle discount to a level that improves each of their individual profits as well as consumer welfare, might provide a more appropriate benchmark for welfare comparisons than the status quo does.

112. We explored this possibility by reprogramming the setting of the discount within the simulation under two scenarios. In the first scenario, the merging parties coordinate in setting a discount level, but all other prices (including those of other providers) remain fixed at status quo levels. In the second scenario, the merging parties first coordinate in setting and announcing a discount level, and then all firms (including the merging parties) play a Nash equilibrium in pricing their components. (In both scenarios, the only synthetic bundle discount that might change is the one that combines DIRECTV’s video service with AT&T’s broadband service; all other discounts remain fixed at the current discount level.) The results from these exercises did not indicate that an alternative discount level would improve both of the merging parties’ profits while also substantially enhancing consumer welfare. Thus, we believe that the current discount level is unlikely to hide any realizable efficiency that significantly skews the results in the Applicants’ favor, and therefore the discount is retained for assessing post-merger welfare gains.

VI. COMPARISON WITH OTHER STUDIES

113. While we are not aware of any empirical analyses of the same product set that has been analyzed here, there are several comparable studies, which we discuss below, that look at subsets of this product set. In this section, we demonstrate that the demand model estimated in the Modified Simulation comports fairly well with the demand models that have been estimated in these studies.

114. Comparing studies that consider distinct (though partly overlapping) product sets and that use different model specifications is not straightforward; because of such differences, we are limited to comparisons of quantities that are reported (or that can be inferred from reported quantities) in the Modified Simulation and other analyses and that carry the same interpretations across models. Given these considerations, we focus on comparisons of own-price demand elasticities (and, when they can be computed, own-price demand semielasticities as well).\(^\text{135}\)

\(^\text{135}\) Let \(\{1, \ldots, m\}\) be a set of products, and, for each \(j \in \{1, \ldots, m\}\), let \(Q_j : \mathbb{R}^m_+ \to \mathbb{R}_+\) denote the demand (as a function of the vector of product prices) for product \(j\). The own-price demand elasticity for product \(j\) at prices \(\mathbf{p}\) can be interpreted as the ratio of the percentage change in product \(j\)'s demand to the percentage change in its price from initial prices given by \(\mathbf{p}\). It is defined as:

(continued….)
A. Studies of the U.S. Broadband Internet Service Market

115. Table 15 summarizes the own-price demand elasticities and semielasticities of broadband Internet access service products from various studies, including the Modified Simulation.

<table>
<thead>
<tr>
<th>Provider or Technology</th>
<th>Study</th>
<th>Years</th>
<th>Elasticity</th>
<th>Semielasticity</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Modified Simulation</td>
<td>2013-14</td>
<td>-0.66</td>
<td>-0.0145</td>
</tr>
<tr>
<td></td>
<td>Carare et al. (2015)(^{136})</td>
<td>2011</td>
<td>-0.62</td>
<td>Not available</td>
</tr>
<tr>
<td></td>
<td>Dutz et al. (2009)(^{137})</td>
<td>2005</td>
<td>-1.53</td>
<td>-0.0375</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2006</td>
<td>-1.17</td>
<td>-0.0299</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2007</td>
<td>-0.88</td>
<td>-0.0238</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2008</td>
<td>-0.69</td>
<td>-0.0195</td>
</tr>
<tr>
<td></td>
<td>Goolsbee (2006)(^{138})</td>
<td>1998</td>
<td>-2.75</td>
<td>-0.0688</td>
</tr>
</tbody>
</table>

(Continued from previous page)

For example, if \( \eta_j(p) = -0.66 \), then, starting from a price vector of \( p \), a 1 percent increase in \( p_j \) would lead the demand for product \( j \) to fall by approximately 0.3 percent. (Note that, because the elasticity captures an instantaneous change, this figure is a first-order approximation.) As mentioned in Section II.B.2, one consequence of the method of estimation (and, in particular, of the construction of price indices) is that only the differences in prices across products are identified. Hence, the price levels themselves (and, by extension, the percentage changes in prices) are not economically meaningful. While the recentering procedure makes the constructed price indices more “price-like,” the caveat remains that, due to the invariance of consumer choice behavior to different price normalizations, the estimated elasticities may not carry their usual interpretations. To address this problem, wherever possible, we compute the own-price demand semielasticity for product \( j \) at prices \( p \), which can be interpreted as the ratio of the instantaneous proportional change in product \( j \)'s demand to the instantaneous level change in its price from initial prices given by \( p \):

\[
\eta_j(p) = \frac{\partial \log(Q_j(p))}{\partial \log(p_j)} = \frac{\partial Q_j(p)}{\partial p_j} \cdot \frac{p_j}{Q_j(p)}
\]

For example, if \( \eta_j(p) = -0.66 \), then, starting from a price vector of \( p \), an increase of $0.01 (or, more generally, of 0.01 units) in \( p_j \) would lead the demand for product \( j \) to fall by approximately 0.2 percent.


<table>
<thead>
<tr>
<th></th>
<th>Study</th>
<th>Year</th>
<th>Price Elasticity</th>
<th>Semi-elasticity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable</td>
<td>Rappoport <em>et al.</em> (2003)</td>
<td>2000</td>
<td>-1.491</td>
<td>Not available</td>
</tr>
<tr>
<td></td>
<td>Modified Simulation</td>
<td>2013-14</td>
<td>-3.67</td>
<td>-0.0814</td>
</tr>
<tr>
<td></td>
<td>Dutz <em>et al.</em> (2009)</td>
<td>2005</td>
<td>-5.12</td>
<td>-0.1212</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2006</td>
<td>-5.48</td>
<td>-0.1287</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2007</td>
<td>-5.59</td>
<td>-0.1322</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2008</td>
<td>-5.21</td>
<td>-0.1312</td>
</tr>
<tr>
<td>AT&amp;T and Telcos</td>
<td>Modified Simulation</td>
<td>2013-14</td>
<td>-4.66</td>
<td>-0.1033</td>
</tr>
<tr>
<td>DSL</td>
<td>Dutz <em>et al.</em> (2009)</td>
<td>2005</td>
<td>-5.71</td>
<td>-0.1490</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2006</td>
<td>-4.78</td>
<td>-0.1365</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2007</td>
<td>-3.98</td>
<td>-0.1299</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2008</td>
<td>-4.04</td>
<td>-0.1356</td>
</tr>
<tr>
<td>ADSL</td>
<td>Rappoport <em>et al.</em> (2003)</td>
<td>2000</td>
<td>-1.462</td>
<td>Not available</td>
</tr>
<tr>
<td>Fiber</td>
<td>Dutz <em>et al.</em> (2009)</td>
<td>2007</td>
<td>-8.70</td>
<td>-0.2198</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2008</td>
<td>-8.11</td>
<td>-0.2160</td>
</tr>
</tbody>
</table>

116. Because the Modified Simulation uses more recent data than do the other studies that are cited in Table 15, it is appropriate to compare the figures from the Modified Simulation to extrapolated versions of the ones from the other studies. We first compare the Modified Simulation to the Dutz *et al.* Study and argue that the elasticities from the Modified Simulation are broadly consistent with a few notable patterns that the Dutz *et al.* Study illustrates.\(^{140}\)

117. First, the Dutz *et al.* Study notes that the own-price elasticity of broadband Internet service is increasing (i.e., decreasing in magnitude), which they argue reflects an increasing tendency among households to view broadband Internet service as a necessity rather than as a luxury. The elasticity and semi-elasticity estimates are consistent with this trend.

118. Second, while the estimates of the Dutz *et al.* Study do not illustrate a clear trend with respect to the own-price elasticity and semielasticity of cable broadband, the values derived from the Modified Simulation are not drastically different from the estimates of the Dutz *et al.* Study, and the fact that the estimates from the Modified Simulation are lower in magnitude could plausibly reflect the fact

---


\(^{140}\) In particular, simple inspection of the estimates in Table 15 do not raise serious concerns about the view that the Modified Simulation estimates and the Dutz *et al.* Study estimates are based on draws from a common time-dependent data generating process, particularly in light of the technological trends that we discuss here.
that, given the increased demand for streaming video content (especially in the years since the Dutz et al. Study), DSL broadband service is increasingly being viewed as an inferior product relative to cable broadband service.\footnote{Of course, the introduction of fiber broadband service is a countervailing factor that, all else equal, should lead to increasingly elastic demand for cable broadband service. However, given the limited availability of fiber broadband service, its increasing strength as a disciplining force on cable broadband is likely less important than the dwindling strength of DSL broadband service – which is much more widely available – as a disciplining force.}

119. Finally, the estimated own-price elasticity for broadband service provided by AT&T and other Telcos reflects the underlying demands for both DSL service and fiber service. As in the case of cable service, the estimates by the Dutz et al. Study for those technologies seem roughly consistent with their analogues from the Modified Simulation, especially in light of the fact that fiber broadband service was a relatively new product during the two years in which the Dutz et al. Study includes it in the analysis. Due to consumers’ unfamiliarity with this product, and also given its fierce competition with cable broadband service – a much more well-established and familiar product – it is entirely plausible that fiber broadband service would have initially exhibited relatively elastic demand that has tapered off as consumers have become more familiar with it.

120. The results of the Goolsbee Study also appear to be roughly consistent with those of the Dutz et al. Study, especially keeping in mind that Goolsbee’s estimates reflect data from 1998. Interestingly, though, the estimates of the Rappoport et al. Study suggest that, even in 2000, the demand for broadband service was significantly less elastic than the estimates from the other studies mentioned above seem to indicate.

B. Studies of the U.S. MVPD Market

121. Two studies of the U.S. MVPD market that allow for meaningful comparisons with the Modified Simulation are due to Goolsbee and Petrin in 2004\footnote{Austan Goolsbee & Amil Petrin, *The Consumer Gains from Direct Broadcast Satellites and the Competition with Cable TV*, 72 ECONOMETRICA 351, 351-381 (2004) (“Goolsbee-Petrin Study”).} and Crawford and Yurukoglu in 2012.\footnote{Crawford-Yurukoglu Study at 643-685.} Table 16 provides their estimates of own-price demand elasticities (and implied estimates of own-price demand semielasticities) of U.S. MVPD products.
Table 16: Comparison of Own-Price Demand Elasticity and Semielasticity Estimates for MVPD Products from Different Studies

<table>
<thead>
<tr>
<th>Technology</th>
<th>Service Type</th>
<th>Study</th>
<th>Years</th>
<th>Elasticity</th>
<th>Semielasticity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable</td>
<td>All</td>
<td>Modified Simulation</td>
<td>2013-14</td>
<td>-8.07</td>
<td>-0.0792</td>
</tr>
<tr>
<td></td>
<td>Basic</td>
<td>Goolsbee-Petrin (2004)</td>
<td>2001</td>
<td>-1.538</td>
<td>-0.0567</td>
</tr>
<tr>
<td></td>
<td>Premium</td>
<td>Goolsbee-Petrin (2004)</td>
<td>2001</td>
<td>-3.175</td>
<td>-0.0823</td>
</tr>
<tr>
<td>Satellite</td>
<td>All</td>
<td>Modified Simulation</td>
<td>2013-14</td>
<td>-7.82</td>
<td>-0.0990</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Goolsbee-Petrin (2004)</td>
<td>2001</td>
<td>-2.448</td>
<td>-0.0612</td>
</tr>
</tbody>
</table>

122. Again, we may view the estimated elasticities from the Modified Simulation as newer versions of their analogues from the other studies referenced in Table 16. Leaving aside the usual caveats regarding estimation errors and differences in methodologies across studies, the figures suggest that demand for cable MVPD service has become more elastic in recent years. This trend is certainly plausible given a number of factors, including the entry of fiber-based competitors (especially Telcos since 2006), the launch of a new satellite by DISH in 2006, which expanded DISH’s channel capacity significantly, and, probably to a lesser extent, the recent advent of online video distributors (“OVDs”) and the resulting increase in so-called “cord-cutting” (i.e., dropping traditional video service and relying solely on access to OVDs through a broadband connection for video service). The first and third factors listed above also may account for an increase (which the above figures suggest) in the elasticity of demand for satellite-based MVPD service.

123. The Modified Simulation semielasticities, compared with the ones based on the estimates of the Goolsbee-Petrin Study, are consistent with the above story as well. Interestingly, though, the Modified Simulation semielasticity for cable MVPD service seems to be much lower in magnitude than the ones derived from Crawford and Yurukoglu’s analysis. This discrepancy appears to be driven largely by price increases in recent years, as the elasticities themselves are not very different.

VII. IMPLICATIONS

124. In considering the implications of the BH Simulation, it is important to keep in mind the limited scope of the exercise. The merger simulation is designed to provide a data-driven, quantitative answer to the following question: “Assuming that all industry participants’ product offerings remain the
same, what price changes arise from the changed pricing incentives created by the proposed transaction?” That is, the simulation speaks to the price effects of the transaction, holding constant the industry product mix. In particular, the simulation ignores any effect that the post-merger integration of the (currently synthetic) bundle that combines DIRECTV’s video programming service with AT&T’s broadband Internet access service would have on consumer welfare other than through a potential change in its price.

125. To answer this question, the BH Simulation simplifies many features of the industry. Notably, it abstracts away from the price discrimination (tiering) that industry participants engage in, as well as from any dynamic considerations (such as the incentives for investment, incentives to change the product mix, and frictions due to consumer switching costs).\textsuperscript{144} Finally, to make it possible to find results, any merger simulation imposes specific forms on demand systems and nesting behavior that are unlikely to match consumer behavior exactly.

126. These simplifications are made to address data limitations and reflect the limits of current modeling technology. They are common in economic analyses of the industry. The model used in the simulation was judged to be an appropriate representation of the state-of-the-art in merger simulation methods. Given the available data and the industry setting, the approach adopted by the parties represents best practice in building a merger simulation. Where we adopted slightly different models, it was due either to minor issues found in code submitted by the Applicants or to the ability of the Commission to access data unavailable to the Applicants. None of these adjustments changed our receptiveness to the general approach.

127. That said, results of the merger simulation should be viewed as only contributing to an understanding of the competitive impact of the proposed transaction. With this caveat in mind, the rest of this section highlights the implications of the Modified Simulation for understanding the likely price effects of the transaction, holding constant the industry product mix.

128. In discussing the quantitative implications, we begin by considering the Modified Simulation under Low PPR, which we believe represents a plausible outcome while also providing a conservative estimate for the consumer welfare gain, as measured by the change in consumer surplus. The Corrected Simulation predicts this number to be $0.30 per month (Table 1), while the Modified Simulation predicts this number to be $0.51 per month (Table 2). The robustness checks that we did, together with information from the Applicants’ submissions,\textsuperscript{145} suggest that these estimates have a non-trivial margin of error around them. While it is difficult to systematically quantify the effect of this margin of error, the robustness checks reported above suggest that the consumer surplus impact – the net effect of the horizontal harm, bundling benefit, and PPR – is likely to be positive, though perhaps modest. In particular, it is unlikely that consumers will be harmed at an aggregate level. Indeed, our best measure of the net effect of the horizontal harm and the bundling benefit under No PPR is that they essentially cancel each other out at the aggregate level. To the extent that we believe that the Low PPR scenario is likely to occur, we also believe that, if anything, the merger is likely to yield modest benefits to consumers in the form of lower prices.

129. The simulation is also capable of giving predictions of consumer impact by location, finding difference in the merger’s effect across DMAs. Here, the most harm done to any one DMA is a loss of $0.04 per household per month in consumer surplus when High PPRs are assumed. For many DMAs, however, the benefit is of a significantly higher magnitude.

130. It is useful to consider a bound on the harm that this transaction may generate. To do this, we consider the Horizontal Effects Simulation, in which AT&T’s video service starts as a standalone

\textsuperscript{144} See Berry-Haile Analysis at 13.

\textsuperscript{145} See Berry-Haile Additional Discussion at 41-44.
business that is then merged with DIRECTV. To get a worst-case estimate of the horizontal harm that the transaction may generate, we focus here on the No PPR scenario. In this case, aggregate consumer surplus falls by $0.29 per household per month. Evaluated DMA by DMA, the greatest potential for harm is in the Houston area, where the purely horizontal effect is estimated to be -$0.70 per month. The numbers serve as an indication of the downside risk associated with the merger. Our judgment is that, while these numbers indicate a potential for harm, the size of this harm, when isolated, is not so large, in and of itself, as to destroy the credibility of a claim that the improved pricing incentives involved in AT&T and DIRECTV moving from a synthetic bundle to an integrated bundle (in addition to the downward pressure this places on cable bundle prices) may provide an offsetting force. Furthermore, these figures are based on the No PPR scenario. Under the more plausible Low PPR scenario, the Horizontal Effects Simulation actually predicts a consumer surplus gain, underscoring the importance of potential downward pricing pressure as a result of PPRs.

131. In a setting in which PPRs are considered, two questions arise for the economic analysis. The first is what the appropriate level of reduction might be to input into the model, and the second is how to interpret the results that the model generates.

132. An examination of the programming data, discussed in Section IV.C, suggests that a \[\text{BEGIN HIGHLY CONF. INFO.}\] reduction in programming payments (i.e., Low PPR) is plausible (though arguably conservative). This is in contrast to the \[\text{BEGIN HIGHLY CONF. INFO.}\] reduction (i.e., High PPR) used in the BH Simulation.

133. Before inputting any assumption regarding PPRs into the simulation, it is important to consider the economic structure imposed by the simulation. A reduction in costs will, regardless of the simulation, be passed through to consumers in some degree in the form of lower prices. All else being equal, this is a benefit to consumers.

134. When applied to the simulation, the assumption of Low PPR is sufficient to make the aggregate effect on consumer surplus positive and sufficiently large to be economically distinguishable from zero. Hence, the evidence presented by the merger simulation suggests an overall effect that is positive for consumers, not only in the aggregate, but also at the DMA level for all but three DMAs.

---

\[\text{BEGIN HIGHLY CONF. INFO.}\] [END HIGHLY CONF. INFO.] As noted before, the BH Simulation abstracts away from dynamic incentives and ignores programmers (and thus programming inputs) completely. As a result, the analysis presented here does not directly address a theory of harm based on the premise that PPRs will tend to reduce programmers’ incentives to invest in high-quality programming, which will eventually lead to quality reductions and, ultimately, adverse effects on consumer welfare. Using the programming payment data presented in Section IV.C, we obtained a worst-case estimate for the total fall in affiliate fees paid by MVPDs to programmers as a result of the merger. This analysis used a run of the Modified Simulation under the assumption of a reduction of \[\text{BEGIN HIGHLY CONF. INFO.}\] per subscriber per month in AT&T’s affiliate fees. In this scenario, programmers were estimated to lose about \[\text{BEGIN HIGHLY CONF. INFO.}\] percent of their affiliate fees. Based on SNL Kagan, TV Networks: Economics Profile & Peer Comparison, rel. March 10, 2015, we estimate that, all else being equal, this drop in affiliate fees would constitute a loss of \[\text{BEGIN HIGHLY CONF. INFO.}\] percent of total programmer revenues and a loss of \[\text{BEGIN HIGHLY CONF. INFO.}\] percent of total programmer profits. The evidence in the record does not support the assertion that these reductions represent anything beyond a redistribution of surplus between programmers and MVPDs. In the absence of evidence that indicates a loss of efficiency or a harm to consumers, the Commission remains agnostic on normative aspects of the division of this surplus.