

# Quantifying Competitive Price Effects in Healthcare Provider Mergers

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## Introduction

The economics literature has greatly expanded the tools available to antitrust practitioners for predicting the effects of healthcare provider mergers. Academic articles in the early 2000s kick-started the development of screening tools for healthcare provider mergers based on a framework called the “two-stage model of hospital competition,” which measures the change in bargaining leverage caused by horizontal mergers.<sup>1</sup> These tools have been frequently used by the Federal Trade Commission to screen mergers and have also been used in litigation to demonstrate competitive effects.<sup>2</sup>

While useful as a signal of the competitive impact of a merger, the change in bargaining leverage is not necessarily the same as the change in price that is often used to quantify the effect of a merger. An additional methodological step is needed to translate bargaining leverage into a predicted price effect. Several methodologies exist, but each can yield different results. No single methodology has garnered consensus despite several litigated hospital mergers during the past two decades. For example, the litigation over the FTC’s challenge to the proposed merger between Hackensack Meridian Health and Englewood Health Foundation in 2021 featured a disagreement among economic experts on appropriate methods and evidence to quantify merger effects.<sup>3</sup>

This article reviews the different ways in which economists approach using changes in bargaining leverage to predict the effect of a merger on prices.<sup>4</sup> More generally, this article summarizes how economists quantify potential competitive harm in the form of price effects from a healthcare provider merger, and details the advantages and disadvantages of each method as well as instances in which they have been applied in litigation. Each of the methods builds upon commonly used merger screening tools like diversion ratios and willingness-to-pay (WTP). The four methods discussed in this article are:

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<sup>1</sup> See Robert Town & Gregory Vistnes, *Hospital Competition in HMO Networks*, 20 J. HEALTH ECON. 733 (2001); Cory Capps, David Dranove & Mark Satterthwaite, *Competition and Market Power in Option Demand Markets*, 34 RAND J. ECON. 737, 739-40 (2003).

<sup>2</sup> See Christopher Garmon, *The Accuracy of Hospital Merger Screening Methods*, 48 RAND J. ECON. 1068, 1069 (2017).

<sup>3</sup> FTC v. Hackensack Meridian Health, Inc., No. 20 Civ.18140, 2021 WL 4145062, at \*1-2, 15-30 (D.N.J. Aug. 4, 2021).

<sup>4</sup> Earlier articles provide more detailed treatments of specific litigated cases, including the methods and tools used to quantify merger effects. This article is aimed at providing a consolidated update on the tools used in more recent litigation. See Cory S. Capps, *From Rockford to Joplin and Back Again: The Impact of Economics on Hospital Merger Enforcement*, 59 ANTITRUST BULL. 443 (2014); Cory Capps et al., *The Continuing Saga of Hospital Merger Enforcement*, 82 ANTITRUST L. J. 441 (2018).

- (1) **Prediction using claims data:** An empirical approach estimating a relationship between price and WTP using historical data, typically data on hospital prices from insurer claims.<sup>5</sup> The approach is based on the assumption that providers negotiate with insurers on a joint basis (i.e., health systems or provider practices derive leverage from the ability to exclude all of their providers from a payor's network if negotiations come to an impasse). This is an approach analogous to seminal academic work on evaluating healthcare provider mergers through changes in bargaining leverage.
- (2) **Extrapolation from retrospective studies:** An empirical approach applying a relationship between price changes and changes in WTP through retrospective analysis of consummated mergers, many or all of which may be in different markets than the one of interest. This method requires extrapolating a study's findings to out-of-sample provider mergers, which may involve differences in negotiation practices.
- (3) **Upward pricing pressure (UPP) analysis:** A theory-based approach for translating economic margins and diversion ratios into predicted price effects. Unlike prediction using claims data, UPP analysis requires an assumption that providers negotiate separately after the merger is consummated (i.e., health systems or provider practices only threaten to exclude one or some providers from a payor's network if negotiations come to an impasse). This method usually has less burdensome data requirements than the regression-based approach using claims data but may be less applicable if providers negotiate with insurers on a joint, all-or-nothing basis.<sup>6</sup>
- (4) **Joint bargaining UPP analysis:** A novel theory-based approach suggested by the author that combines the intuition of WTP and UPP analysis and remedies many of the practical problems of the other methods.<sup>7</sup> Unlike UPP, it is derived assuming hospitals negotiate jointly on an all-or-nothing basis.

Quantifying the potential for anticompetitive harm is often an important step in merger evaluation. For example, providing a prediction of expected price changes (before efficiencies) can be used to determine whether the magnitude of potential harm is economically meaningful, or if the level of cognizable efficiencies is large enough that the transaction is procompetitive.<sup>8</sup> This step can be useful at all stages of the evaluation process; it provides guidance for the merging parties on whether to pursue the merger, the agencies on whether to challenge the merger, and the courts in forming an opinion in litigation. A consolidated review of these quantification methods should therefore be a useful resource for healthcare antitrust practitioners.

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<sup>5</sup> Market-specific pricing data are required to conduct this exercise; claims data are a common source for obtaining negotiated prices in healthcare provider cases.

<sup>6</sup> While derived based on an assumption of separate bargaining, UPP can still provide a useful and informative approximation to merger effects when providers negotiate on an all-or-nothing basis since changes to bargaining leverage under both negotiating strategies rely on the substitutability of the merging parties, which is directly measured under UPP. One difference between UPP and the other methods is that because UPP assumes separate bargaining, the model predicts a price effect separately for each provider. The other methods that assume all-or-nothing bargaining can only make predictions on the average price across all owned providers, and additional assumptions would have to be made to assign a price effect by provider.

<sup>7</sup> See Keith Brand & Christopher V. Lau, *A First-Order Approximation to Merger Effects when Prices are Determined through Joint Bargaining*, 3-4 (working paper, 2023), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4638878](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4638878).

<sup>8</sup> U.S. Dep't of Justice & Fed. Trade Comm'n, *Merger Guidelines* (2023) at § 3.3, <https://www.justice.gov/d9/2023-12/2023%20Merger%20Guidelines.pdf>.

*Bargaining leverage is determined by how valuable one side of the negotiation is to the other, that is, how much reaching an agreement adds to the provider's and insurer's profits.*

## Screening Tools for Measuring Competitive Intensity

The methods for quantifying merger effects use tools developed in the academic literature and are commonly used by antitrust practitioners when evaluating healthcare provider mergers.

The standard framework for analyzing healthcare provider mergers is a model of bargaining between health insurers and healthcare providers over reimbursement rates. In such models, the relevant question for merger analysis is whether consolidation leads to increased bargaining leverage for the provider relative to an insurer. Bargaining leverage is determined by how valuable one side of the negotiation is to the other, that is, how much reaching an agreement adds to the provider's and insurer's profits.

How valuable providers are to insurers can in many cases be proxied by understanding patient choices. In particular, patient choices can be used to answer three questions that help evaluate whether a merger increases the bargaining leverage of the merging providers: (1) What providers are patients currently choosing? (2) What other providers would patients be willing to see? And (3) how much do patients value having access to these providers?<sup>9</sup>

**What providers are patients currently choosing?** When many patients visit a particular provider, this often signals that patients find the services the provider offers valuable, a concept referred to as revealed preferences. The value that patients place on a provider can make the provider important to the insurer since including that provider in a health plan's network makes the insurer more appealing to customers. When two providers that see many patients in the same market merge, this increases concentration and can make the merged provider even more important to the insurer. This may be associated with increased bargaining leverage and market power if the firms are substitutes. Concentration is measured by **market shares** and the **Herfindahl-Hirschman Index (HHI)**. The 2023 Merger Guidelines provide standards for market shares and HHIs under which the agencies may consider a merger presumptively anticompetitive, as did the prior 2010 Horizontal Merger Guidelines and presumably any future guidelines.<sup>10</sup>

**What other providers would patients be willing to see?** The extent of the potential anticompetitive effects of a merger depends on the level of substitution between the merging providers. When two providers are highly substitutable, insurers have the ability to play them off each other. For example, if one provider requests a price increase, the insurer can incentivize patients to choose the other provider and still have a health insurance plan that is nearly as marketable as a plan with both providers. When the two providers merge, this dynamic is lost, resulting in increased bargaining leverage for the combined entity. Substitution is often measured with **diversion ratios**, which are estimates of the percentage of patients who would go to a different provider when another is not available (or, more generally, in the event of a price increase). When diversion ratios between the merging parties are high, they are more substitutable for one another, which signals a merger would increase the providers' bargaining leverage.

**How much do patients value having access to these providers?** The actual value that patients derive for access to certain providers can be a very important screen for evaluating whether a merger is anticompetitive. Notably, this question incorporates the previous two questions: Patients value providers more when they like the provider they are currently seeing, and/or

<sup>9</sup> In practice, patient choice data are used to estimate patient choice models, which are a key tool for economists to infer how much patients value each provider on average. These models can be used to predict the likelihood that each patient will visit each provider when seeking care, including in counterfactual situations, such as when patients no longer have access to a specific provider.

<sup>10</sup> See U.S. Dep't of Justice & Fed. Trade Comm'n, Merger Guidelines (2023) at § 2.1; U.S. Dep't of Justice & Fed. Trade Comm'n, Horizontal Merger Guidelines (2010) at § 5.3, <https://www.justice.gov/atr/file/810276/dl>

when they are unwilling to see other providers. The value patients place on having access to providers is often measured using **WTP**, which is the incremental value patients would be willing to pay from adding a particular provider to an insurer's network given the other providers already in the network. When patients have more value for having access to a provider, the insurer is also willing to pay more to ensure those providers are included in their network, which results in more bargaining leverage for the provider. Thus, when a merger increases WTP because patients value having both merging providers in their network more than they value adding each individually, the combined entity has more bargaining leverage.

### Translating Screening Tools into Predicted Price Effects

While the screening tools described above are useful for flagging potentially anticompetitive mergers, the magnitude of these screening tools does not have a direct welfare interpretation. For example, what values of the change in WTP constitute a “large” increase and what does that mean for insurers negotiating with providers? A common way for economists to make such evaluations is to standardize these metrics in terms of monetary changes. Of particular interest to merger analysis, diversion ratios and WTP can be converted into a prediction of provider price effects (holding all else equal). This results in values that are easier to interpret for practitioners.

In the case of provider mergers, there are several ways to do this, each with its own advantages and disadvantages. The two empirically-based methods are discussed first, followed by the two theory-based methods.

**Prediction using claims data.** When providers negotiate with insurers using an all-or-nothing bargaining strategy, price increases are determined by the bargaining leverage gained from being able to exclude both providers simultaneously compared to each separately. As discussed earlier, this is often measured using the change in WTP. The WTP approach to understanding provider mergers was initially developed by Town & Vistnes (2001) and Capps, Dranove & Satterthwaite (2003).<sup>11</sup> To interpret the change in patient WTP as a monetary amount that reflects the dollar value of bargaining leverage, Capps, Dranove & Satterthwaite regressed observed hospital profits on WTP derived from an empirical patient choice model for all hospitals in the region they studied and multiplied the change in WTP by the resulting regression coefficient to measure the profit increase experienced by the merging parties.

Following this blueprint, economists have used insurer claims data to identify the empirical relationship between patient WTP and provider prices negotiated with insurers. Specifically, this prediction approach regresses provider prices on WTP and provider costs for all providers in a geographic region.<sup>12</sup> The coefficient on WTP should be positive, signaling that WTP and prices are correlated such that the change in WTP is a reasonable proxy for measuring price effects. Quantifying the price effect from the merger is then given by the product of the coefficient from the regression of price on WTP ( $\beta$ ) and the change in WTP:

$$\beta \times \text{Change in WTP}$$

One advantage of this approach is that it is based on academic, peer-reviewed papers. Furthermore, it empirically confirms that there is a relationship between WTP, which is a measure of patient preferences, and negotiated prices, which reflect bargaining between the provider and insurer.

<sup>11</sup> Town & Vistnes, *supra* note 1; Capps, Dranove & Satterthwaite, *supra* note 1.

<sup>12</sup> See Joseph Farrell et al., *Economics at the FTC: Hospital Mergers, Authorized Generic Drugs, and Consumer Credit Markets*, 39 REV. INDUS. ORG. 271, 272-82 (2011).

One disadvantage is that the required empirical work can be burdensome to execute. The regression involves data on price and costs not just from the merging parties but from third parties in the geographic region, and such third party data may be difficult to obtain, especially during a merger investigation before litigation.<sup>13</sup> Furthermore, the regression may be limited by the data. For example, there may just not be much data available (small sample sizes) or the data may have limited cross-sectional variation that could result in imprecise estimates. Finally, while this approach relies on a simple regression analysis, it can be sensitive to many practical issues and assumptions that can have a large impact on the results. For example, the observed prices may be subject to measurement error, calling into question the reliability of any predictions based on those prices. The selection of hospitals in the geography used in the regression can also have substantial effects on the results.

This approach to measuring merger effects is used by the government's expert (Professor Robert Town) in the FTC's challenge of the proposed acquisition of St. Luke's Hospital by ProMedica Health System in 2012. In his initial decision, the FTC's Administrative Law Judge (ALJ) described the expert's process for quantifying harm through predicted price effects:

Professor Town determined the impact of bargaining power on price by using the average case-mix adjusted inpatient prices and the hospital willingness to pay measures to assess the relationship between willingness to pay and the price of inpatient care. Professor Town then used his predicted prices and his willingness to pay measures, controlling for other factors . . . in the regression.

. . . Professor Town calculated the price impact of the Joinder by using the estimated relationship between willingness to pay and inpatient rates, along with the change in willingness to pay resulting from the Joinder, to calculate the likely impact of the Joinder on the price of inpatient care.<sup>14</sup>

Professor Town's exercise resulted in a predicted price effect of 16.2 percent across the two hospital systems.<sup>15</sup> The ALJ agreed with Professor Town's opinions and concluded that:

by eliminating MCOs' [Managed Care Organizations'] option of contracting with St. Luke's alone, the Joinder will significantly increase Respondent's bargaining leverage in negotiations with MCOs and provide Respondent with sufficient market power to enable it to increase the reimbursement rates it charges MCOs for GAC inpatient hospital services.<sup>16</sup>

The Commission and the U.S. Court of Appeals for the Sixth Circuit upheld the ALJ's decision upon appeal.<sup>17</sup>

While courts generally find prediction using claims data persuasive in ProMedica/St. Lukes, academic studies have called its accuracy into question. For example, Garmon (2017) calculates observed price changes from consummated mergers and compares them to the predictions using claims data approach, along with other evaluation metrics and screening tools. Garmon finds that a predicted price increase of 1 percent using the claims data approach is associated with between a 0.38 percent *decrease* and a 0.12 percent increase in observed prices, depending on

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<sup>13</sup> Third parties used in the regression do not necessarily need to be included in a formal relevant market definition; for example, this methodology may be used to help define a relevant market by implementing a hypothetical monopolist test (predicting whether a hypothetical monopolist would raise prices by a small but significant non-transitory increase in price).

<sup>14</sup> ProMedica Health System, 152 F.T.C. 708, 2011 WL 11798464, at \*62-63 (Dec. 5, 2011).

<sup>15</sup> *Id.* at \*63.

<sup>16</sup> *Id.* at \*6.

<sup>17</sup> ProMedica Health Sys., Inc. v. FTC, 749 F.3d 559, 561 (6th Cir. 2014).

the specification used.<sup>18</sup> None of these specifications are statistically significant, which the author attributes to imprecision of the estimated price-WTP relationship caused by limited cross-sectional observations.<sup>19</sup>

**Extrapolation from retrospective studies.** A less burdensome approach to quantifying merger effects than using claims data is to rely on the regression results of Garmon (2017). This study compared the changes in WTP to observed price changes from 28 consummated mergers between 1998 and 2012. Restricting to a subsample of 17 mergers that did not result in variable cost savings, the study found a regression coefficient of 0.57, suggesting that a 1 percent increase in WTP was associated with a 0.57 percent increase in prices.<sup>20</sup> As a result, this regression estimate provides a direct estimate of the relationship between change in WTP and price effects, such that the predicted price change from a merger can be calculated as the product of 0.57 and the change in WTP:

$$0.57 \times \text{Change in WTP}$$

One advantage of this approach is that it is simple to implement and does not rely on any additional data. It is also based on an article from an academic, peer-reviewed economics journal.

One disadvantage is that applying the findings of retrospective studies is not based on economic theory because it is not derived from a model of firm behavior; rather, it is an observed empirical relationship. In addition, unlike the claims data approach, the 0.57 estimate is merely an average across many markets. Furthermore, because it is based on only 17 (or 28 for the full sample of) observations, it is very unlikely that the actual market being evaluated was included as part of this study. Even if the market being evaluated is one of the markets studied in Garmon (2017), competitive conditions may have changed over time. This means that its prediction will likely be an out-of-sample extrapolation that may not apply to the relevant population.<sup>21</sup> Finally, this study was specifically done for hospital mergers, and thus may not necessarily apply to mergers between other types of healthcare providers, such as physicians, or changes in WTP that result from non-merger conduct.

This approach to measuring merger effects is used by the government's expert (Prof. Leemore Dafny) in the FTC's challenge of Hackensack Meridian Health's proposed acquisition of Englewood Healthcare Foundation in 2021. The decision of the U.S. Court of Appeals for the Third Circuit described Prof. Dafny's harm calculation:

Dafny used both her patient-based willingness-to-pay model and information from a peer-reviewed paper to generate her calculations. . . .

The study Dafny used evaluated twenty-eight hospital mergers and examined whether there was a statistically significant correlation between a change in patient preferences and a change in price. Dafny testified that substantial literature supports the general proposition that hospitals that perform more strongly in the willingness-to-pay analysis command higher negotiated prices in the marketplace. In addition to this general principle, she explained that she was selective when using the study to make her calculations. She included only the mergers without variable cost savings because she had

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<sup>18</sup> Garmon, *supra* note 2, at 1096.

<sup>19</sup> *Id.* at 1097.

<sup>20</sup> *Id.* at 1096.

<sup>21</sup> Other research has found a different relationship than Garmon (2017) using a different data sample. See Zarek Brot-Goldberg et al., *Is There Too Little Antitrust Enforcement in the Us Hospital Sector?* (working paper, 2024), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4826708](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4826708), at 11, A.20.

accounted for any cost savings from this merger as part of her efficiencies analysis. If she had not eliminated those cost-saving mergers from her calculations, she would be “double counting” the savings.<sup>22</sup>

This exercise resulted in a prediction of \$31 million in consumer harm, which is the aggregate value of the predicted price increase applied to all patients impacted by the merger.<sup>23</sup>

The methodology used by the government’s expert was challenged by the defendants. First, they argued the calculation was unreliable because “it was based on a single study and . . . did not use an appropriate coefficient.”<sup>24</sup> In particular, the defendants argued that a more appropriate specification of Garmon (2017)’s study (estimates based on a sample that did not restrict to mergers without variable cost savings) found no statistically significant relationship. In addition, they argued that the study was not representative of the parties in the litigation because it did not include any hospitals in New Jersey.<sup>25</sup> Second, the defendants argued that the plaintiff’s expert should have conducted her extrapolation using claims data, which the defendants’ expert had done and found no statistically significant relationship between price and WTP in Northern New Jersey.<sup>26</sup>

The government’s expert argued that extrapolation from retrospective studies for the sample that did not exhibit variable cost efficiencies was appropriate in this context.<sup>27</sup> She also responded by “adjust[ing] for the supposed flaws in the other expert’s methodology,” finding that “using this [claims] data showed a statistically significant relationship between patient preferences and price, . . . result[ing] in price increase estimates that were higher than those using her original methodology.”<sup>28</sup>

Both the District Court of New Jersey and the Court of Appeals for the Third Circuit relied on her harm calculation based on Garmon (2017) as evidence in their decision to grant a preliminary injunction.<sup>29</sup>

**Upward pricing pressure analysis.** Upward pricing pressure is a tool used by antitrust practitioners to measure the incentive a firm has to raise prices after a merger. It can be viewed as a method for converting diversion ratios into predicted price effects.<sup>30</sup> While originally developed by Farrell and Shapiro (2010) in a retail-like setting,<sup>31</sup> it can also be derived under a bargaining framework assuming that providers negotiate separately after the merger.<sup>32</sup> Specifically, a prediction of the merger-induced percentage increase in price is given by the product of diversion ratios ( $d_{ij}$ ), the ratio of prices ( $p_j/p_i$ ), the margins ( $m_j$ ), and a bargaining weight ( $\alpha$ ) that measures the relative bargaining ability of each side of the negotiation:

$$(1-\alpha) \times d_{ij} \times \left(\frac{p_j}{p_i}\right) \times m_j$$

<sup>22</sup> FTC v. Hackensack Meridian Health, Inc., 30 F.4th 160, 174 (3d Cir. 2022).

<sup>23</sup> *Id.* at 175.

<sup>24</sup> Hackensack Meridian Health, Inc., 2021 WL 4145062, at \*22.

<sup>25</sup> *Id.*

<sup>26</sup> *Hackensack*, 30 F.4th at 174.

<sup>27</sup> *Id.*

<sup>28</sup> *Id.* at 174-75.

<sup>29</sup> *Id.*; *See also* Hackensack Meridian Health, Inc., 2021 WL 4145062, at \*22..

<sup>30</sup> UPP is also sometimes viewed as a simplified merger simulation that does not account for marginal cost efficiencies.

<sup>31</sup> Joseph Farrell & Carl Shapiro, *Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition*, 10 BE J. THEORETICAL ECON. 1 (2010).

<sup>32</sup> Garmon, *supra* note 2, at 1077.

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The logic of UPP in the healthcare merger context is as follows: Suppose two provider groups merge and continue to negotiate separately after the merger. If one of the providers demands a higher price, the insurer may decide to end negotiations and exclude it from the network. The insurer would do this because it believes its members would be willing to visit other providers in its network. If one of those providers is the merging partner, the combined entity can recapture some of the patients it lost from being excluded from the network. The more the provider can recapture under a hypothetical disagreement, the more it can mitigate losses from being out-of-network with the insurer. Because failing to reach an agreement is less costly for the provider under the merger, its bargaining leverage relative to the insurer increases. Thus, higher diversion ratios signal a greater incentive to raise prices. Furthermore, there will be a greater incentive to raise prices when those recaptured patients are more valuable, as measured by the merging partner's profit margins. Thus, higher margins of the merging partner also signal a greater incentive to raise prices. Separate decisions on network inclusion are essential for this logic, since they are based on the idea that the combined firm can recapture patients if one of its providers is excluded, but another is not.<sup>33</sup>

The advantage of the UPP approach is that it may be easier to compute with information that is typically available during a merger investigation. Furthermore, it follows an intuitive logic that is consistent with the economic theory of how firm incentives change after a merger and is commonly used for antitrust analysis across many industries.

An important disadvantage of the UPP approach is that it assumes individual providers negotiate separately with insurers,<sup>34</sup> which may not always fit the market facts.<sup>35</sup> In addition, because UPP is a theory-based approach, it can be difficult to verify how well the bargaining model explains the data. This is unlike the claims data approach, which can be verified with the price-WTP regression.

The UPP approach to measuring harm is used by the government's expert (Dr. Steven Tenn) in the FTC's challenge of the proposed merger between Advocate Health Care Network and North-Shore University Health System in 2016.<sup>36</sup> Plaintiff's Proposed Findings of Facts and Conclusions of Law describes their expert's method to calculating harm:

Dr. Tenn . . . conducted a merger simulation analysis to predict the likely competitive impact of the Proposed Merger. Consistent with the economics literature and the *Merger Guidelines*, he uses price and margin data from the parties, together with the estimated diversion ratios, to predict the post-merger price change.<sup>37</sup>

The district court's opinion further elaborates:

<sup>33</sup> The price ratio is used to scale diversions and margins in a way such that UPP can be represented as a percentage change in price. The bargaining weight represents the fact that prices are negotiated, so only a negotiated portion of the incentive to raise prices will be passed through to actual price increases.

<sup>34</sup> In certain cases, separate bargaining may be more appropriate. For example, the settlement of the 2019 antitrust case against Sutter Health requires the hospital system to engage in separate bargaining going forward. *See* Final Approved Order, UFCW & Emp. Benefit Tr., et al. v. Sutter Health, et al., No. CGC-538451, 2021 5027178, at \*1 n.2 (Cal. Super. Ct. Aug. 27, 2021) (incorporating by reference the Settlement Agreement attached as Appendix 1 to the December 19, 2019 Motion for Preliminary Approval of Settlement).

<sup>35</sup> *See* Brand & Lau, *supra* note 7, at 27.

<sup>36</sup> WTP analysis was also conducted by the government's expert but was not translated into a price increase or as a quantification of consumer harm.

<sup>37</sup> *See* Plaintiff's Proposed Findings of Fact and Conclusions of Law, *FTC v. Advocate Health Care*, No. 15-cv-11473, [D.E. 468] at ¶ 69 (N.D. Ill. May 31, 2016). (internal citations omitted).



Based on the diversion ratios and pricing data from the relevant hospitals, and assuming that the range of variable cost margins for commercial admissions (*i.e.*, the difference between revenue and variable costs) at NorthShore hospitals was comparable to the range at Advocate hospitals, Dr. Tenn calculated that the merger would cause an average price increase of 8% across the six party hospitals in the North Shore Area, resulting in an annual increase of inpatient GAC reimbursement paid to those hospitals of about \$45 million.<sup>38</sup>

The defendants argued that this model was inconsistent with commercial realities of the hospital industry because it reflects a price-setting type of model, rather than a bargaining-based model.<sup>39</sup> The defendants were referring to the fact that UPP analysis was originally developed in a retail-like setting in which sellers post a price, and consumers decide whether or not to purchase the product at that given price. Dr. Tenn responded by arguing that a price-setting model was used for ease of exposition and that “one way to think about the posted price model is that it is a reduced form way of capturing a complicated underlying bargaining relationship.”<sup>40</sup>

The court found “that Dr. Tenn has persuasively demonstrated that the merger is likely to cause a significant price increase resulting in a loss to consumers.”<sup>41</sup>

**Joint bargaining UPP analysis.** Finally, Brand & Lau (2024) have proposed an approach that weds the all-or-nothing bargaining logic of WTP with the conceptual and practical advantages of UPP. This approach provides a theory-based prediction of the price change from a merger when providers negotiate using an all-or-nothing strategy, and can be written as the product of the bargaining weight ( $\alpha$ ), the change in WTP, and pre-merger margins ( $m$ ):<sup>42</sup>

$$(1-\alpha) \times \text{Change in WTP} \times m$$

In other words, the predicted price change will be large when the merger increases bargaining leverage (*i.e.*, when the change in WTP is large), and margins are high.<sup>43</sup>

The advantage of this approach is that, like UPP, it can be estimated with information that is typically available during a merger investigation and directly incorporates the merging parties’ margins in a theoretical way. However, the joint bargaining UPP is based on an all-or-nothing bargaining strategy that is common in many healthcare markets. Furthermore, it is based on economic theory (since it is derived from a model of how providers and insurers negotiate over prices) rather

<sup>38</sup> FTC v. Advocate Health Care, No. 15 C 11473, 2017 WL 1022015, at \*8 (N.D. Ill. Mar. 16, 2017).

<sup>39</sup> *Id.* at \*9.

<sup>40</sup> *Id.* at \*10.

<sup>41</sup> *Id.* at \*10.

<sup>42</sup> See Brand & Lau, *supra* n.7, at 17-18. This formulation of their metric, which is referred to as WTP-UPP in their working paper, assumes margins are the same for both firms. When margins between the two merging parties are different, the formula is:

$$(1-\alpha) \times \left( \left( \frac{1}{m_i} \times \left( \frac{WTP(i)}{WTP(ij)} \right) + \frac{1}{m_j} \times \left( \frac{WTP(j)}{WTP(ij)} \right) \right)^{-1} - m \right)$$

where  $m_i$  is the margins of one of the merging parties,  $m_j$  is the margins of the other merging party, and  $m$  is the discharge-weighted average between the two.

<sup>43</sup> The joint bargaining UPP is derived by first calculating the compensating marginal cost reduction (CMCR) in a bilateral negotiation scenario with joint, all-or-nothing bargaining. The CMCR is the amount of marginal cost efficiencies the merging firm must obtain to just offset competitive harm for the merger (*i.e.*, such that the merger will not induce a price increase on average). This is useful because equilibrium, or “feedback,” effects from third-party providers should be minimal. Equilibrium, or “feedback,” effects occur when third-party providers adjust their prices in response to the merging parties’ price changes that result from the merger. The CMCR can then be reframed as the price increase when there are zero marginal cost efficiencies, which yields the metric.

than empirical relationships that may be difficult to apply in certain circumstances, or may not be applicable in others.<sup>44</sup>

*While economic analysis has helped guide courts' decisions in healthcare provider mergers, economic experts have used at least three different methods to quantify the potential harm from the merger.*

While courts have yet to provide an opinion on this method of quantifying merger effects, Brand & Lau (2024) offer evidence that suggests their measure yields a more accurate prediction than other approaches. Specifically, they recreate the results of two academic articles that evaluate the predictive accuracy of the above quantification tools. The first article is Balan & Brand (2023), which compares the UPP and the prediction using claims data approaches to outcomes from a computational model that simulates several thousands of hospital mergers and incorporates several real-world features of healthcare in the United States.<sup>45</sup> The second article is Garmon (2017), which compares the UPP and the prediction using claims data approaches to observed price changes from consummated mergers.<sup>46</sup> Brand & Lau (2024) find that the joint bargaining UPP metric generally outperforms both UPP and prediction using claims data at flagging anticompetitive mergers, and predicting price effects.<sup>47</sup>

### Conclusion

While economic analysis has helped guide courts' decisions in healthcare provider mergers, economic experts have used at least three different methods to quantify the potential harm from the merger. This article provides an up-to-date review of these methods, and summarizes the advantages and disadvantages of each method and how they have been applied in litigated healthcare provider mergers.

Prediction with claims data provides a data-driven methodology for translating WTP into prices, but may be burdensome or difficult to implement in practice. Extrapolation with retrospective studies is simpler to implement and is based on empirical results from consummated mergers, but may not be applicable to the merger being evaluated. UPP provides a theory-based approach that is simple to implement, but may rely on assumptions that differ from common bargaining dynamics used in healthcare provider mergers. Joint bargaining UPP incorporates these bargaining dynamics into the UPP setting, but has not yet been applied to a litigated matter.

While there is not yet a preferred methodology among economists and antitrust practitioners for evaluating healthcare provider mergers, understanding how they can be applied is important for both the government and the merging parties. ●

<sup>44</sup> In addition, because it was derived by first identifying the CMCR, it also provides a threshold level for which to compare efficiencies.

<sup>45</sup> See Brand & Lau, *supra* n.7, at 19-30.

<sup>46</sup> *Id.* at 30-34.

<sup>47</sup> *Id.* at 4-5.