

# **Economics at the FTC: Spatial Demand, Veterinary Hospital Mergers, Rulemaking, and Noncompete Agreements**

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**Abstract:** The U.S. Federal Trade Commission enforces federal competition and consumer protection laws that prevent anticompetitive, deceptive, and unfair business practices, and works to advance government policies that protect consumers and promote competition. The FTC's Bureau of Economics performs economic analysis to support both the enforcement and policy activities of the Commission. This article discusses several examples of these activities. We first discuss some work our economists have done on spatial considerations in demand estimation, and then present an analytical approach developed to assess consumer choice between service providers using data on geographic variation in the location of the customers of two merging service providers. This technique is discussed in the context of the analysis of the competitive effects of a merger of veterinary hospitals. Next, we discuss an important tool in the FTC's arsenal: rulemaking. We describe the benefits and costs of rulemaking, the rulemaking process, and the role of economic analysis in that process, and we then highlight recent FTC rulemaking activities and the economic analysis of a proposed rulemaking banning employers from imposing non-compete clauses in employment contracts.

**Keywords:** Antitrust, Consumer Protection, FTC, Mergers, Rulemaking

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## I. Introduction

The U.S. Federal Trade Commission (FTC) enforces federal competition and consumer protection laws that prevent anticompetitive, deceptive, and unfair business practices, and works to advance government policies that protect consumers and promote competition. The FTC's decisions are informed by economic analysis performed by the economists, financial analysts and statisticians in the Bureau of Economics (BE). The FTC is primarily a law enforcement agency, enforcing federal competition and consumer protection laws, although it also fulfills its missions in various other ways including rulemaking, research, studies on marketplace trends, public outreach, and consumer and business education. BE's staff, which currently consists of over 80 Ph.D. economists, nine research assistants/statisticians, eight financial analysts, and five administrative professionals, perform a wide range of analyses across broad sectors of the economy.

In this article we focus on several examples of economic analysis done in support of the FTC's law enforcement investigations and rulemakings. In addition, BE economists also conduct economic research to address important economic issues. BE economists may collaborate with colleagues from across the FTC on commission studies and reports which may or may not relate directly to ongoing enforcement activities or policy initiatives. One example of such a study is an inquiry of pharmacy benefit managers announced in June of 2022.<sup>1</sup> The Commission voted to require the six largest pharmacy benefit managers to provide information and records regarding their business practices to enable staff to study the impact of vertically integrated pharmacy benefit managers on the access and affordability of prescription drugs. BE economists also work on more narrowly focused research projects which often get disseminated in the form of working papers and academic journal articles.

BE maintains connections to the academic economic research community through a weekly seminar series and by organizing the annual FTC Microeconomics Conference (sponsored by the Tobin Center for Economic Policy at Yale). The 2022 conference, the 15<sup>th</sup> installment, featured

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<sup>1</sup> See FTC press release, <https://www.ftc.gov/news-events/news/press-releases/2022/06/ftc-launches-inquiry-prescription-drug-middlemen-industry> (last accessed July 6, 2023).

paper sessions, keynote addresses and panel discussions.<sup>2</sup> The 16<sup>th</sup> installment of the FTC Microeconomics Conference will be held on November 2-3, 2023 in Washington, DC.<sup>3</sup>

Throughout the past year, FTC economists have been busy providing economic analysis in connection with numerous high-profile antitrust investigations, including Meta-Within, Microsoft-Activision, Illumina-Grail, ICE-Black Knight, and Altria-Juul,<sup>4</sup> just to name a few. This casework often presents challenges in terms of modeling novel economic environments or analyzing large amounts of data. However, the cumulative effect of mergers in small markets can matter just as much as high profile mergers (Wollmann, 2020). FTC economists continue also to provide support for investigations in relatively lower-profile industries in which data may be somewhat more limited, which can present its own problems.

In Section II of this article, we start with a discussion of research conducted by BE economists on spatial markets, including the use of location information for demand estimation. We then describe a method of economic analysis that can be utilized to examine the loss of competition resulting from a merger when we only possess detailed information about the merging parties' customers. One can use the detailed data from the merging parties to estimate parameters in a choice model, and then infer customer preferences for non-merging competitors. We show how to apply this approach in the context of veterinary hospital mergers.

In Section III we cover rulemaking, as the FTC is now undertaking several new rulemakings. We first discuss the benefits and costs to rulemaking as opposed to enforcement of the FTC's Section 5 standard prohibiting deceptive and unfair acts and practices or unfair methods of competition. We then provide an overview of the process under which the FTC can issue regulations or rulemakings, paying special attention to the economic analysis that may be performed as part of that process. The section also discusses recent FTC rulemakings, including

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<sup>2</sup> Conference materials are posted at <https://www.ftc.gov/news-events/events/2022/11/fifteenth-annual-federal-trade-commission-microeconomics-conference>.

<sup>3</sup> For details, see: <https://www.ftc.gov/news-events/events/2023/11/sixteenth-annual-microeconomics-conference>.

<sup>4</sup> See case materials at <https://www.ftc.gov/legal-library/browse/cases-proceedings/221-0040-metazuckerbergwithin-matter>, <https://www.ftc.gov/legal-library/browse/cases-proceedings/2210077-microsoftactivision-blizzard-matter>, <https://www.ftc.gov/legal-library/browse/cases-proceedings/201-0144-illumina-inc-grail-inc-matter>, <https://www.ftc.gov/legal-library/browse/cases-proceedings/221-0142-intercontinental-exchange-incblack-knight-inc-matter>, and <https://www.ftc.gov/legal-library/browse/cases-proceedings/191-0075-altria-groupjuul-labs-matter>.

some of the economic analysis performed for an FTC notice of proposed rulemaking to, with limited exceptions, ban employers from imposing non-competes on their workers.

## II. Demand Estimation and Spatial Markets: FTC Research and An Application to Veterinary Hospital Mergers with Limited Customer Data

A proposed merger may eliminate substantial competition between the merging firms. One way to assess the degree of competition that may be at risk is to gather evidence on how likely consumers are to switch between the firms' products or services. In spatial markets, the distance between firms and consumers may be a key driver of substitution patterns.

In this section, we first discuss the research by economists in BE on the role of distance in consumer demand and firm competition in spatial markets. This research develops new models of spatial demand, examines the predictive power of such models, investigates the reasons why distance matters in spatial markets, and shows how the location of merging parties affects estimates of merger effects from retrospectives.

We then discuss an application that highlights a key difference between the process of academic research and agency enforcement. As the FTC's research on spatial markets demonstrates, microdata can be very helpful to estimate the effects of distance on spatial demand and then conduct merger simulations. Empirical work by academics typically relies on datasets with information on most if not all competitors in an industry – such as all-payer healthcare claims data or the Nielsen Homescan dataset – or is specific to one firm, such as Dominick's Foods in Chicago or platforms like eBay or Airbnb.

Economists at the FTC use such data when appropriate for the economic analysis performed for a merger investigation. However, an enforcement agency can often get additional detailed microdata – such as consumer loyalty card information -- from both merging parties but not from other firms. It can be costly and difficult to obtain data from third parties to the transaction, and the time constraints of the merger process can make it hard to obtain and combine several firms' data.

In this section, we show one approach taken by FTC economists to tackle the challenge of using such data in the context of merging veterinary hospitals. Using only the datasets of the

merging parties, we describe an approach to identify the disutility of distance, a key driver of consumer substitution patterns, and then estimate how close competitors the merging parties are.

#### A. FTC Research on Spatial Markets

When demand is spatial, consumers prefer options located closer to them, all else equal. Economists have traditionally modeled spatial demand through a measure of distance, such as travel time, that enters linearly or quadratically in utility. However, spatial preferences may not just depend on a singular distance measure; for example, consumers may prefer not to cross bridges or enter certain neighborhoods. FTC economists have been researching these issues actively, starting with a discussion by Hosken and Tenn (2016) of the application of spatial demand models that allow for non-parametric distance preferences to retailing.

Raval, Rosenbaum, and Tenn (2017) develop a computationally light semiparametric estimator that flexibly estimates substitution patterns allowing for more general preferences. The semiparametric model first partitions patients into groups based upon patient characteristics, using patient zip code as the measure of location. A group might be identified by the combination of a patient zip code, age, disease severity, and diagnosis category. One can then estimate choice probabilities and substitution patterns by assuming that substitution is proportional to share within each group; thus, the model is equivalent to an extremely flexible multinomial logit model with thousands of interactions of several different patient characteristics. This semiparametric model can be estimated extremely quickly and easily compared with the parametric multinomial logit.

The key tuning parameter is the minimum size of a group, which regulates a bias-variance tradeoff; larger groups result in an estimator with greater bias but lower variance. By varying this parameter, the researcher can quickly adjust the degree of flexibility of the model and examine the robustness of any findings. Lau (2023) and Panhans (2023) implement this estimator in Stata and R, respectively; academic research is increasingly using it to model spatial demand (e.g., Barrette, Gowrisankaran, and Town, 2022). Raval, Rosenbaum, and Wilson (2021) show how to extend the grouping approach to apply machine learning models like random forests and gradient boosting trees to spatial demand.

FTC economists often estimate spatial models of demand to utilize in merger simulations. Assuming a Nash in Nash bargaining framework, Balan and Brand (2023) show that merger

simulations of hospital mergers provide a better guide to merger effects with more accurate estimates of hospital demand. Raval, Rosenbaum, and Tenn (2017) apply their estimator to hospital mergers. In Monte Carlo simulations, they find that the semiparametric estimator does a good job of predicting proxies for merger harm such as diversion ratios and willingness to pay in several scenarios, including when utility is linear in travel time as the parametric multinomial logit assumes.

Raval, Rosenbaum, and Wilson (2022) assess how well spatial demand models predict diversion ratios through natural experiments. They exploit a set of natural disasters – two tornadoes, the Northridge earthquake, and Superstorm Sandy – that temporarily destroy six hospitals. The markets range from large urban areas to rural settings, and the hospitals include major academic medical centers and community hospitals, increasing the likelihood of external validity from the experiments.

These disasters allow one to observe where patients go when they cannot go to their first-choice hospital, and so provide an experimental analogue to an insurer excluding a hospital from network. Raval, Rosenbaum, and Wilson (2022) compare the semiparametric estimator to spatial demand models using travel time in the academic literature, including Capps, Dranove, and Satterthwaite (2003), Ho (2006), and Gowrisankaran, Nevo, and Town (2015), that include flexible interactions between patient and hospital characteristics. They find that the semiparametric model is better at predicting individual choices than these alternative models, and equally predictive of aggregate diversion ratios.<sup>5</sup>

However, Raval, Rosenbaum, and Wilson (2022) also show that all of the demand models systematically underpredict diversion to the hospitals with the largest observed diversion ratios. A ten percentage point increase in the observed diversion ratio increases the gap between the predicted and observed diversion ratios by 3.5 to 4.3 percentage points. Because the models tend to underpredict diversion to nearby options, including a random coefficient on travel time could allow patients of the destroyed hospitals to be more sensitive to distance than the average patient. Model predictions of aggregate diversion ratios improve by 20 to 25% after including such a random

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<sup>5</sup> Raval, Rosenbaum, and Wilson (2021) find that two machine learning models – random forests and gradient boosting trees – outperform all the models at individual choice prediction, although their performance suffers when examining patients who were most likely to go to the destroyed hospital and so experience a change in their choice set.

coefficient. Thus, Raval, Rosenbaum, and Wilson (2022) conclude that random coefficients on distance can improve prediction of spatial demand even when rich microdata allows flexible controls for observed heterogeneity.

FTC economists also use merger retrospectives to evaluate merger simulation models and assess the effects of mergers (Garmon, 2017); in spatial markets, merger effects can vary based on the location of the merging parties. Ashenfelter, Hosken, and Weinberg (2015) examine the Miller-Coors beer merger and find efficiencies from redistributing production between Miller and Coors breweries that lowered prices in markets far from a Coors brewery pre-merger. Brand and Rosenbaum (forthcoming) find that price effects of hospital mergers generally decline in the distance between the merging hospitals. However, economists have also found evidence of price effects from mergers of hospitals operating in different local markets (Brand and Rosenbaum, 2018); Brand and Rosenbaum (forthcoming) find price effects for in-state, but not out of state, cross market hospital mergers.

While distance is a strong predictor of demand in spatial models, it is not clear whether this relationship is causal. Distance effects could reflect transport costs or that distance is correlated with unobserved consumer preferences, a phenomenon known as home bias. Raval and Rosenbaum (2021) examine women's choice of hospital for childbirth and separate the two effects using women who move between births and switch hospitals. If transport costs are large, women should typically switch to hospitals near their new residence. Raval and Rosenbaum (2021) find that the effect of distance falls by 40% after accounting for home bias.

One potential explanation for this difference is the conditional logit model used in Raval and Rosenbaum (2021) did not allow for switching costs. However, Raval and Rosenbaum (2018) estimate both distance and switching costs in the same context and find similar, lower estimates of transport costs after controlling for home bias. Because estimates of switching costs also fall after controlling for unobserved heterogeneity, patients' trade-offs between distance and switching costs remain the same.

Raval and Rosenbaum (2021) show that referral patterns likely explain part of the home bias effects by magnifying the effects of distance on demand. Consistent with this explanation, controlling for the hospitals at which the operating physician at birth practices can explain about

half the gap between the estimate of distance in a standard logit model and the estimate after accounting for home bias. In simulations, Raval and Rosenbaum (2021) show that the home bias from ignoring referral patterns can understate merger harm.

While this section has focused on antitrust applications for spatial demand models, such models also apply to cross-border fraud, a major concern for the FTC’s consumer protection enforcement. Grosz and Raval (2023) build a model of trade that includes fraud; the model predicts that cross-border fraud, like trade flows, should decline with distance. They then empirically verify this prediction using consumer complaint data from three datasets, although physical distance matters less and cultural distance matters more for fraud complaints compared to trade. Finally, Grosz and Raval (2023) use these models to identify hotspots for cross-border fraud, including West Africa and the Caribbean.

We now turn to veterinary care, one market in which FTC economists have used spatial demand models to analyze the predicted effects of a proposed merger.

#### B. Veterinary Care

Veterinary care is a unique health care market to study. First, unlike humans, few pets have health insurance, and health pet insurance is not subsidized by governments the way human health insurance is.<sup>6</sup> Thus, pricing of health care works very differently for pets compared to humans. Nevertheless, Einav et al. (2017) document several similarities between human and pet health care. In addition, referrals are much less important for pet health care compared to human health care.

Consumers seek emergency veterinary care or veterinary specialist care—for example, the services of a veterinary oncologist, who would render care in a similar manner to an oncologist treating cancer in humans—by traveling to emergency or specialty veterinary clinics. These clinics are distinct from general practice veterinary care, just like a family practice group is different from an emergency room or specialist medical practice for human patients. The difference is in terms of the facilities and equipment employed, as well as in the qualifications of the medical practitioners.

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<sup>6</sup> Less than 5% of dogs and 2% of cats are insured. See [https://naphia.org/wp-content/uploads/2023/05/NAPHIA-SOI2023-Report-Highlights\\_Public-May9.pdf](https://naphia.org/wp-content/uploads/2023/05/NAPHIA-SOI2023-Report-Highlights_Public-May9.pdf) for data on the number of insured dogs and cats in the US in 2022, and <https://ebusiness.avma.org/files/ProductDownloads/eco-pet-demographic-report-22-toc-introduction.pdf> for data on the number of pet dogs and cats in 2022 in the US.



Specialist veterinarians, in addition to their Doctor of Veterinary Medicine (DVM) degree, complete a residency in their chosen specialty. Of the over 100,000 practicing DVMs in the United States in 2022, approximately 14,000 were veterinary specialists.<sup>7</sup> Of the approximate 30,000 veterinary clinics in the United States in 2021, 12 to 15% were accredited as 24-hour emergency clinics by the American Animal Hospital Association, based on their anesthesia monitoring and disease prevention practices.<sup>8</sup>

The FTC recently investigated a series of veterinary hospital mergers. In August 2017, the FTC settled with Mars, Inc. in its acquisition of pet care company VCA, requiring the divestiture of 12 specialty and emergency veterinary hospitals that left competition within local markets unaffected by the larger transaction. In February of 2020, the FTC similarly settled with Compassion First Pet Hospitals in its acquisition of National Veterinary Associates, requiring the divestitures of veterinary hospitals in three geographic areas.<sup>9</sup> Finally, in June 2022, the FTC required JAB, owner of Compassion First/NVA pet hospitals, to divest specialty and emergency pet hospitals in several geographies in addition to imposing strict limits on future acquisitions in its serial acquisitions of SAGE Veterinary Partners, LLC, and Ethos Veterinary Health, LLC.<sup>10</sup>

An important consideration in analyzing competition between veterinary hospitals is the role of hospital location. Much like human health care, customers or patients prefer to use animal hospitals that are nearby, so hospitals compete more intensely when they are close to each other, other things equal. Hence, a merger of emergency or specialty veterinary hospitals located near each other that offer comparable services may diminish local competition amongst the hospitals for the same consumers. One way to assess the scope of competition between nearby hospitals is to estimate diversion ratios and upward pricing pressure associated with a combination of the merging parties' hospitals located even considerably distant from one another.<sup>11</sup> This approach to

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<sup>7</sup> See the American Veterinary Medical Association's reports on the profession at <https://www.avma.org/resources-tools/reports-statistics>. Specialists include all active board-certified diplomates as of December 2021.

<sup>8</sup> See <https://www.veterinarypracticenews.com/24-hour-emergency-vet-clinics/>.

<sup>9</sup> See <https://www.ftc.gov/news-events/news/press-releases/2017/08/ftc-requires-mars-divest-12-veterinary-clinics-condition-acquiring-pet-care-company-vca-inc>.

<sup>10</sup> See <https://www.ftc.gov/legal-library/browse/cases-proceedings/2110140-jab-consumer-partnersnational-veterinary-associatessage-veterinary-partners-matter>.

<sup>11</sup> This distance was chosen to be over-inclusive, as the draw areas for a typical emergency or specialty veterinary practice, for any area of specialty, are generally well-contained within the area formed by a 50-mile radius around the hospital.

identifying the competitive hospitals does not require the delineation of geographic markets that include or exclude any set of veterinary hospitals.

### C. Demand Estimation

To assess the competitive effects of the merger, we use customer-level data supplied by the merging parties. While these data are very rich in the sense of providing information about the geographic locations of customers and service providers, only customers of the merging party hospitals are present. In contrast, the discharge data we generally use to analyze patient choice in the context of inpatient hospital mergers for humans include all inpatient discharges for facilities located in a U.S. state. Not having data on the customers who chose the non-merging hospitals can make it difficult to assess the extent to which consumers view those as substitutes for the merging hospitals.

We discuss below a methodology developed to use these limited data to infer the disutility of distance for customers, which can help define geographic markets. With some additional assumptions, we can also estimate diversion ratios—i.e., the share of consumers who would divert to the merging partner were one party hospital to be unavailable—from each merging party hospital to the merging partner’s facilities. Given these diversions and estimates of the hospitals’ marginal costs by service, we estimate upward pricing pressure created by the merger.

The merging parties supplied detailed transaction-level data for each of their owned veterinary hospitals, consisting of the date of service, type of service rendered, including department or specialty (i.e., emergency, oncology), the physical location of the veterinary hospital visited (latitude and longitude), and customer address with latitude and longitude. For some of the parties’ facilities, the data included more detailed information about the type of service rendered (i.e., a specific surgery, infusion or radiation for treatment of cancer). We observed some information on prices paid, but we could not identify standardized sets of services associated with those transactions that would enable the creation of a series of comparable prices or price indices across hospitals. We also had data on the physical addresses, driving times and distances to all other nearby third-party veterinary hospitals offering the same service.

We can use this data to estimate a simple conditional logit model of veterinary hospital choice in which travel distance is the only covariate. Because the data do not include reliable

information about the prices that consumers paid for comparable services, we assume that prices do not vary during the period of the data sample, and that hospital-specific constants capture persistent differences in prices across hospitals. Let consumer  $i$ 's utility associated with veterinary hospital  $j$  for service  $k$  be

$$u_{i,j,k} = \alpha_{j,k} - \beta_k \cdot d_{i,j} + \varepsilon_{i,j,k},$$

where  $d_{i,j}$  denotes customer  $i$ 's travel distance or travel time to hospital  $j$  and  $\varepsilon_{i,j,k}$  is an extreme value distributed, i.i.d. error term.

The simple conditional logit model implies that the probability that customer  $i$  chooses veterinary hospital A is

$$Pr[A] = \frac{\exp(\alpha_{A,k} - \beta_k \cdot d_{i,A})}{\sum_j \exp(\alpha_{j,k} - \beta_k \cdot d_{i,j})}. \quad (1)$$

Because we possess customer data for only the merging parties' veterinary hospitals, we must estimate customers' disutility of travel from only a subset of customers residing in the draw areas (the geographic region from which the hospital attracts its patients) for each veterinary hospital. McFadden (1984) establishes that one can obtain a consistent estimate of  $\beta_k$  from a sample consisting of observations conditioned on a limited subset of options being selected, in this case, the party-owned hospitals, due to the IIA property of the conditional logit model.<sup>12</sup> We therefore estimate the disutility of travel for each service  $k$ . We can then use this information about disutility for travel to help develop geographic markets, as well as to examine how the size of geographic markets vary by service.

#### D. Identifying Competing Locations

Diversion ratios are one approach to gauging the degree of substitutability or closeness of competition between alternative products or services that a customer might choose. The diversion ratio measures the share of one alternative's customers that would divert to another alternative in response to an increase in its price, or to its disappearance from the choice set. Given the available data and assumption of logit demand, and consistent with Farrell et. al. (2011),<sup>13</sup> we measure diversion from one veterinary hospital A to a competitor B, for service  $k$ , as

<sup>12</sup> Manski and Lerman (1977) also discuss the same result, which they attribute to McFadden.

<sup>13</sup> See the expression for diversion on pp. 276.

$$DR_{A \rightarrow B, k} = \frac{\sum_i Pr_{i,k}(\widehat{B} \mid \widehat{excl A}) - \sum_i Pr_{i,k}(\widehat{B})}{\sum_i Pr_{i,k}(\widehat{A})}$$

For each customer  $i$  who sought service  $k$  and who resided within the draw area of veterinary hospital A for the same service, we sum the predicted likelihood of choosing each of A and B (denoted  $Pr_{i,k}(\widehat{A})$  and  $Pr_{i,k}(\widehat{B})$ , respectively), as well as the predicted likelihood that the customer would choose hospital B in the absence of A, denoted  $Pr_{i,k}(\widehat{B} \mid \widehat{excl A})$ , which given the logit assumptions equals  $Pr_{i,k}(B)/(1 - Pr_{i,k}(A))$ . The diversion ratio therefore equals the expected number of customers who would choose hospital B upon closure of A, minus the expected number of customers who choose hospital B, which equals the total number of diverted customers to B as a proportion of A's customers. For example, if hospital A and B each serve 50 customers residing within A's draw area, and the predictions of the choice model suggest that B would serve 60 customers in the absence of A, the estimated diversion from A to B equals 20% (= (60 - 50) / 50, or 10 customers as a share of A's 50 total customers).

The diversion ratio above thus depends only upon two probabilities for each individual and service:  $Pr_{i,k}(A)$  and  $Pr_{i,k}(B)$ . The conditional logit model, however, identifies the conditional probabilities  $Pr_{i,k}(A|A \text{ or } B)$  and  $Pr_{i,k}(B|A \text{ or } B)$ . To estimate the diversion ratios, we would need additional assumptions to identify the unconditional probabilities (or, alternatively,  $Pr_{i,k}(A \text{ or } B)$ ).

Because we possess draw data for only customers who chose merging parties' hospitals, we cannot reliably observe the differentials in quality across veterinary hospitals embedded in  $\alpha_{j,k}$  for third-party facilities. To estimate choice probabilities for non-merging hospitals, one potential assumption is that veterinary hospitals are differentiated only by physical location for a given service, which implies that  $\alpha_{j,k} = \alpha_k$  for all  $j$ . These intercepts then drop out of Equation (1), and the choice probabilities become purely a function of the disutility of travel and the distance each consumer must travel to each hospital. These choice probabilities can then be used to estimate diversion ratios. We can test this assumption with the hospital-specific intercepts for the merging parties estimated from Equation (1).

While a customer's experience at a veterinary hospital at one visit may influence the likelihood of visits for other services, we assume for simplicity that a customer's choice to visit a

hospital for a given service is independent of the other services provided by that hospital. In essence, each service of the hospital is treated as a separate market. In practice, we examined both hospital-level and hospital-chain-level diversions, with the latter indicating the extent to which a post-merger price increase at, or closure of, one veterinary hospital would benefit the merging partner across all of its veterinary hospital locations for a given service.

Although we lack reliable price data, we assume that veterinary hospitals compete in part on price. If the merger combines veterinary hospitals under common ownership that customers consider to be viable substitutes for a service  $k$ , the merger will eliminate price competition. Post-merger, the combined firm recognizes that any sales diverted from one location in response to a price increase or closure to a merging party location are now earned by the merged entity, reducing its previous incentive to compete for customers. The value of diverted sales can be thought of as the opportunity cost of price competition with its merging partner.

To gauge the combined veterinary hospital firm's incentives to increase prices at any given location for a service  $k$ , we can calculate the approximate predicted price increase using a generalized upward pricing pressure index ("GUPPI") in the vein of, e.g., Jaffe & Weyl (2013). Specifically, we can calculate GUPPI in percentage terms for veterinary hospital firm A merging with firm B, assuming that A's hospitals are indexed by  $m$  and B's hospitals by  $n$ , as

$$\sum_m \sum_n \widehat{DR}_{m \rightarrow n, k} \cdot m_{n, k} \cdot (p_{n, k} / p_{m, k}) \cdot Rev_{m, k},$$

where  $\widehat{DR}_{m \rightarrow n, k}$  denotes the estimated diversion from A's hospital  $m$  to B's hospital  $n$ , for service  $k$ ;  $m_{n, k}$  denotes the incremental margin earned by B's hospital  $n$  when rendering service  $k$ , as a percentage of price;  $p_{n, k}$  and  $p_{m, k}$  denote the firms' prices for service  $k$  at hospitals  $m$  and  $n$ ; and  $Rev_{m, k}$  the revenue share contributed by hospital  $m$  to B's total sales amongst competitive hospital locations.

To calculate GUPPI, we have to combine estimated diversions with estimates of the veterinary hospitals' incremental margins, the ratio of prices, and revenue shares across locations. Obtaining an economically meaningful measure of incremental margins can be challenging (Sacher & Simpson, 2020), but one way to approximate incremental margins for emergency and specialty veterinary services is to calculate contribution margins from accounting data supplied by the merging parties for the veterinary hospitals in question. Conceptually, the contribution margin is

the share of revenue remaining after variable costs have been covered. As discussed above, we assume that for each set of hospitals  $m$  and  $n$ ,  $p_{n,k}/p_{m,k} = 1$ .<sup>14</sup> Combining these assumptions, and further assuming a pass-through rate equal to “one” so that GUPPI equals the predicted price increase, yields estimates of the approximate predicted price increase at each of the merging party’s veterinary hospitals for each service  $k$ .<sup>15</sup>

#### E. Discussion

This approach to merger analysis in veterinary hospital mergers is somewhat unique in two respects—first, that we possess unusually precise customer location data (i.e., customer address) for the merging parties’ hospitals, and second, that we leverage these data to estimate competitive effects in the absence of a more universal customer dataset. Because we possess only the merging parties’ customer data, from which we infer their choice dynamics, we rely extensively on the underlying assumptions of conditional logit to infer customer travel costs, and that of otherwise homogenous hospitals to estimate choice probabilities. From these assumptions, we estimate diversions between party hospitals and the upward pricing pressure and price effects that would result from their merger. We calculate these predicted price increases to evaluate whether the combination of a given set of the parties’ veterinary hospitals would lead to a significant reduction in competition.

While in practice we describe very generally the geographies in which a proposed transaction raises competitive concerns (e.g., the San Francisco Bay Area), our approach to estimating competitive effects in these mergers does not require precise boundaries of geographic markets in which merger-related harm would occur. However, the estimated disutility of distance can also be used to help define geographic markets.

### III. Rulemaking at the FTC

#### A. Background

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<sup>14</sup> This assumption could be adjusted accordingly if there were evidence of a price differential between hospitals.

<sup>15</sup> Academic studies, such as Miller, et al (2017), have shown that under certain, reasonable, demand forms, the pass-through rate is about “one”, meaning the GUPPI is a good approximation for the predicted price increase that would occur in the absence of any marginal cost efficiencies.

In addition to its enforcement authority, the FTC has the authority to issue regulations or rulemakings to address unfair or deceptive practices that are prevalent or unfair methods of competition. The FTC uses rules to, among other things, codify certain practices or methods considered to be prohibited under the FTC Act and/or impose explicit requirements to accomplish a specific regulatory objective. Conceptualizing the tradeoffs with promulgating rules, as opposed to relying on the FTC's Section 5 enforcement authority, in many ways mirrors the rules versus standards debate in law and economics (Ehrlich and Posner (1974), Kaplow (1992)).

Kaplow (1992) defines the distinction between a rule and a standard as whether efforts to give content to the law occur before or after individuals act. Take, for example, highway safety. A standard might prohibit driving at excessive speeds; whether a driver is doing so might depend upon the weather, the condition of the road, the number of other drivers on the road, and the time of day. A judge would have to weigh these factors and others to decide whether a driver violated the law. A rule, on the other hand, might be a speed limit of 70 mph. To determine if someone violated the law by speeding, a judge would just need to see the reading of a speedometer, a factual finding. And the driver can look at their dashboard to know if they are violating the law.

Rules and standards lie on a continuum in their degree of specificity. In the consumer protection context, the FTC's Section 5 authority that prohibits deceptive and unfair practices would be considered a "standard" as defined by Kaplow (1992) – it does not enumerate all of the various types of conduct that are deceptive or unfair. However, the FTC's policy statements defining deception and unfairness, its business guidance, and the case law from FTC enforcement actions all serve to put meat on the bones of the Section 5 standard. Rulemakings can also vary in how prescriptive they are. On the prescriptive end of the spectrum, the FTC's Funeral Rule requires funeral homes to provide a price list when a consumer asks for one, and details specific language that funeral homes must use in the price list and specific prices that they must itemize.<sup>16</sup>

One advantage of rules is that it may be less costly for the legal system to determine whether a rule has been violated along several dimensions. First, the agency incurs costs while developing evidence of wrongdoing. For example, to use its Section 5 unfairness enforcement

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<sup>16</sup> See [https://www.ftc.gov/system/files/ftc\\_gov/pdf/565A\\_Complying%20with%20Funeral%20Rule\\_2023\\_508.pdf](https://www.ftc.gov/system/files/ftc_gov/pdf/565A_Complying%20with%20Funeral%20Rule_2023_508.pdf) for the FTC's guidance on complying with the Funeral Rule.

authority, the FTC has to show that a firm's practices led to substantial injury to consumers, that the practices were not reasonably avoidable by consumers, and that the injury was not outweighed by countervailing benefits to competition or consumers.<sup>17</sup> To enforce the Funeral Rule, on the other hand, the agency might only need to show that a funeral home refused to provide a price list, or that its price list did not conform to the rule's requirements. It does not have to show any injury to consumers to prove liability.<sup>18</sup>

In addition, going to trial based on the FTC's enforcement authority can be quite costly. If rules make it easier to prove liability from socially undesirable activity, it may take less time and effort for a judge to decide a case. Parties may be more likely to settle out of court quickly as well if the decision that the court would make is more predictable. Finally, by making it clear to market participants what behavior violates the law and what the likely sanction of that activity is, rules can increase the probability that socially undesirable activity is punished, and so decrease the prevalence of such activity.

However, rulemaking also imposes costs. First, it is costly for regulatory agencies to promulgate rules. In the next subsection, we discuss the multi-step "notice and comment" process required to write rules. Second, firms may incur additional costs to ensure compliance with the rule such as hiring lawyers to provide legal advice beyond the costs of complying with the standard.<sup>19</sup> Finally, the rule could impose direct costs on businesses such as developing and maintaining otherwise unnecessary business records.

When might a rule be preferable to a standard? If an unfair or deceptive practice is common across firms in an industry, it could be quite costly for an agency to bring enforcement actions against every firm with the practice. The largest cost of developing the rule might only be incurred

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<sup>17</sup> See the FTC's policy statement on unfair acts and practices, available here: <https://www.ftc.gov/legal-library/browse/ftc-policy-statement-unfairness>.

<sup>18</sup> The FTC regularly conducts undercover operations to detect funeral homes that do not abide by the rule. Violators can enter the Funeral Rule Offenders Program run by the National Funeral Directors Association in lieu of a potential FTC lawsuit. It provides participants with a legal review of the price disclosures required by the Funeral Rule, and on-going training, testing, and monitoring for compliance with the Rule. In addition, funeral homes that participate in the program make a voluntary payment to the U.S. Treasury in place of a civil penalty and pay annual administrative fees to the Association. See <https://www.ftc.gov/news-events/news/press-releases/2010/03/undercover-inspections-funeral-homes-nine-states-washington-dc-press-funeral-homes-comply-consumer>.

<sup>19</sup> Kaplow (1992) argues that it is ambiguous whether a rule or standard leads to greater compliance costs, depending on whether and how firms choose to become informed of their obligations under each policy.



once and might quickly change firm behavior for the reasons laid out above. A rule also ensures consistent application of the law, as firms with the same practices would be treated the same. On the other hand, depending on the degree of potential harm to be addressed, it might be difficult to justify rules to cover conduct that is relatively rare, or which varies substantially in characteristics across firms. In addition, for more prescriptive rules, firms might learn how to evade a rule with slight changes in behavior that would still be covered under the standard.

Rules can be both overinclusive – prohibiting conduct that might be socially desirable— and underinclusive – allowing socially undesirable conduct— compared to standards set in broad statutory authority language. For the issue of overinclusion, an enforcement agency has discretion on how to enforce the rule and can use its discretion to allow socially desirable conduct. For example, a police officer might not give a speeding ticket to a driver with a medical emergency driving above the speed limit to get to a hospital.

The development of the Internet provides a case study of how rules can be underinclusive. It took time for the FTC to learn about persistent problems in new online markets and for Congress to pass laws to address these problems. For example, Congress passed the Children’s Online Privacy Protection Act (COPPA) in 1998, at the end of the dot-com boom, and the FTC published the rules COPPA required in 2000. The Health Breach Notification Rule, on data breaches in health care markets, was published in 2009. Through the FTC rule review process, these rulemakings have been amended or are under review for potential modifications to address changes in technology since they were initially published. The Section 5 standard, however, applied to online conduct from the beginning of the Internet. It equally applies to new AI technologies being developed today.<sup>20</sup> Broad standards can thus complement more specific rules.

A key question for both rules and standards are the sanctions allowed for proscribed conduct. Historically, the FTC has relied on Section 13(b) of the FTC Act as the primary means for both returning money to consumers that resulted from violations of the Section 5 standard, as well as for equitable relief (such as a prohibition on misrepresentations or requirements to develop a

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<sup>20</sup> As Chair Lina Khan states, “Although these tools [AI] are novel, they are not exempt from existing rules, and the F.T.C. will vigorously enforce the laws we are charged with administering, even in this new market.” See [https://www.nytimes.com/2023/05/03/opinion/ai-lina-khan-ftc-technology.html?te=1&nl=dealbook&emc=edit\\_dk\\_20230516](https://www.nytimes.com/2023/05/03/opinion/ai-lina-khan-ftc-technology.html?te=1&nl=dealbook&emc=edit_dk_20230516).

data security program). In the 2021 decision in *AMG Capital Mgmt., LLC v. FTC*, however, the Supreme Court held that “Section 13(b) does not authorize the Commission to seek, or a court to award, equitable monetary relief such as restitution or disgorgement”.<sup>21</sup> By removing the possibility of monetary relief, this decision likely means less deterrence of deceptive and unfair conduct violating Section 5 of the FTC Act.

Rulemaking can enhance deterrence of such conduct by allowing the FTC to obtain monetary redress for consumers. In addition, unlike the Section 5 standard, the FTC can obtain civil penalties from violations of rules. Not surprisingly, the FTC has signaled that it would exercise its rulemaking authority to allow for civil penalties to be sought against violators and provide for greater ability to obtain redress and damages for consumers.<sup>22</sup>

#### B. The Process of Rulemaking

Diver (1983) identifies three dimensions for legal rules. The first, transparency, is that it is clear what the rule means. The second criterion, accessibility, is that the rule can be applied to a situation without undue effort. The third criterion, congruence, is that the rule achieves the outcome desired by the policymaker, such as prohibiting only socially undesirable behavior. In practice, writing rules requires complex trade-offs amongst these dimensions. For example, a more detailed, prescriptive set of rules might be transparent – every lawyer agrees on the meaning of each rule – but not accessible – a business must hire a lawyer to provide guidance on how to act given the rules.

How do policymakers ensure that they reach the right tradeoffs when writing a rule? The federal government follows a multi-step “notice and comment” process that iterates between agency action and public comment. This process provides information to the public on what the agency is considering and information to the agency on what the public is concerned about. It informs both the public and policymakers on the potential costs and benefits of a rule. Finally, the

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<sup>21</sup> *AMG Capital Mgmt., LLC v. FTC*, 141 S. Ct. 1341 (2021).

<sup>22</sup> See

[https://www.ftc.gov/system/files/documents/public\\_statements/1596664/agency\\_priorities\\_memo\\_from\\_chair\\_lina\\_m\\_khan\\_9-22-21.pdf](https://www.ftc.gov/system/files/documents/public_statements/1596664/agency_priorities_memo_from_chair_lina_m_khan_9-22-21.pdf).

process provides “error correction”, as public commenters can point out flaws in the agency’s reasoning and suggest alternate rules.<sup>23</sup>

The first step in this process is that the FTC may, and in some cases must, gather information and increase public participation through an “advance notice of proposed rulemaking” (ANPR) in the Federal Register before developing a proposed rule. The ANPR gives interested parties an opportunity to submit comments on their perspectives on whether a rule is needed, concerns, and any supporting data so that the agency can consider it as part of the rulemaking record in developing the draft proposal.

Second, the agency publishes a general “notice of proposed rulemaking” (NPRM) in the Federal Register. The NPRM explains an agency’s statutory authority for rulemaking, summarizes the issues it seeks to address and why a rule is necessary, and provides the details of its proposal, in addition to the language for the amendments to the standing body of law in the Code of Federal Regulations. The NPRM also invites the public to provide comments, supporting evidence, and data to inform the rulemaking.

A key feature of many federal rulemakings is the requirement for agencies to consider both costs and benefits of the rule before implementing new regulatory actions and to make that underlying analysis public. Rules that have “an annual effect on the national economy of \$100,000,000 or more” should include a regulatory analysis that projects benefits and any adverse economic effects or consequences, as well as that of any alternative approaches.<sup>24</sup> This analysis, also commonly known as a “regulatory impact analysis” (RIA), is made available for public review and comment.

The regulatory impact analysis in rulemaking is based on a total welfare standard. Thus, transfers between economic agents do not count as benefits. Take, for example, a rule that provides better information on products to consumers, and so reduces search frictions and increases competition amongst sellers. The reduced search costs to consumers or reduced deadweight loss from increased output would count as benefits under the rule. Lower prices to inframarginal consumers would not. In contrast, evidence that a merger would raise prices to consumers or lower

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<sup>23</sup> Diver (1983) discusses further issues when rulemaking is done by ordinary humans as opposed to a perfectly rational social planner.

<sup>24</sup> 15 U.S.C. § 57b-3

wages to workers might prompt an agency to block the merger without having to show that these effects outweigh increased profits to the merging firms.

In the Appendix, we provide an overview of the steps involved in developing a regulatory analysis of a rule as detailed in the Office of Management and Budget's (OMB's) primary guidance for federal agencies in developing regulatory impact analyses.<sup>25</sup> The general process for developing the regulatory analysis includes: (1) developing a detailed description and analysis of the need for the regulatory action and explanation of how the proposed action would address the underlying problem, (2) developing the baseline against which impacts are measured, (3) identifying potential regulatory alternatives, (4) an analysis of the expected benefits and costs of the proposed regulatory action as well as each of the alternatives that have been identified, and (5) summarizing the findings of the regulatory analysis.<sup>26</sup>

At the final step, the agency publishes a final rule notice. The final rule is structured similarly to the NPRM, except that it also includes the agency's summary and assessment of significant issues raised by public comments in response to the NPRM and a final regulatory analysis.

Economic and technological change mean that rules may have to adjust to changing circumstances. To make its rules dynamic, the FTC typically conducts rule reviews every 10 years. For example, the FTC promulgated the Funeral Rule requiring funeral homes to disclose price lists in 1982, before the existence of the Internet. In a recent rule review, it has asked for public comment on amending the rule to require funeral homes to place price lists online.

### C. Rulemakings at the FTC

In Spring 2023, 22 rulemakings were in development at the FTC.<sup>27</sup> These rulemakings included modifications of existing rules as well as new rulemaking activity.<sup>28</sup>

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<sup>25</sup> This guidance is provided in OMB's Circular A-4, [https://obamawhitehouse.archives.gov/omb/circulars\\_a004\\_a-4/](https://obamawhitehouse.archives.gov/omb/circulars_a004_a-4/).

<sup>26</sup> In practice, depending on data availability, the magnitude of the expected impacts specific to the rule, and other analytical resource and time constraints, the extent of and areas of focus for the analysis can vary.

<sup>27</sup> Here, we rely on the Unified Agenda of Federal Regulatory and Deregulatory Actions, a semi-annual resource for the public to preview all federal rulemakings anticipated to occur within a 12-month time frame or beyond if they are listed as long-term actions. Our count excludes the annual "Regulatory Review" notification listing. The current Unified Agenda is available at: <https://www.reginfo.gov/public/do/eAgendaMain>

<sup>28</sup> Reviews or modifications of existing rules are conducted as part of the FTC's ongoing 10-year review program modeled after provisions in the Regulatory Flexibility Act, 5 U.S.C. 601-612 in compliance with the Small Business Regulatory Enforcement Fairness Act of 1996.

Table 1 displays a select, recent portfolio of new rulemakings and rule reviews that BE staff have been involved in developing. The table includes the year of initial publication, the current status of the rulemaking, as well as either the description of proposed rules at the NPRM stage or the topic of rulemakings at the ANPR stage. For rule reviews that discuss many topics or changes, we only describe one major potential change.

Table 1 reveals four broad eras of rulemaking at the FTC. First, while the FTC had enacted industry-specific interpretive or advisory rules since its inception, it only began writing regulations with the force of law in the 1960s. The FTC adopted more than twenty such regulations between 1963 and 1975 under the Administrative Procedures Act (APA), which governs most rulemaking in the federal government. In 1975, Congress passed the Magnuson-Moss Warranty – FTC Improvement Act (Magnuson-Moss), which granted the FTC new rulemaking authority for consumer protection but required more complex procedures than APA rulemaking. Many rulemakings were initiated under Magnuson-Moss soon after its passage, but only five became law. In the 1980s through 2010s, most rules promulgated by the FTC were required by laws passed by Congress that allowed APA procedures for the rulemaking.<sup>29</sup> Finally, the FTC has begun a new era of rulemaking in the past two years with several ongoing new rulemakings.

The rulemakings in Table 1 encompass a variety of topics, including impersonation and business opportunity scams, fake reviews and endorsements, and negative option subscriptions, as well as industries as diverse as funeral homes, amplifier manufacturers, optometry practices, and auto dealers. Many rules respond to broader technological changes, such as potentially requiring price lists to be available online, clarifying that a rule applies to health apps, and protecting consumers’ privacy and data in the modern surveillance economy.

While almost all the rulemakings in Table 1 concern consumer protection, the FTC has recently begun a rulemaking on non-compete agreements, which would be its first rulemaking based on its unfair methods of competition authority since 1968 (Chopra and Khan, 2020). In the following subsection, we provide additional background and economic analysis for this rule.

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<sup>29</sup> See Parnes and Jennings (1997) and Lubbers (2014) for more on the history of FTC rulemaking.

Table 1: Select Recent FTC Rulemakings

Rule	Year/ Status <sup>a</sup>	Description of Proposed Rule (NPRM) or Topic of Rule (ANPR)
<b>New Rulemakings</b>		
<a href="#">Deceptive or Unfair Earnings Claims</a>	2022; ANPR	Deceptive or unfair marketing using earnings claims
<a href="#">Rule on Commercial Surveillance and Data Security</a>	2022; ANPR	Protection of people’s privacy and information in the commercial surveillance economy
<a href="#">Rule on Impersonation of Government and Businesses</a>	2022; NPRM	Prohibit the impersonation of government, businesses, or their officials
<a href="#">Unfair or Deceptive Fees Rule</a>	2022; ANPR	Junk Fees, i.e. unnecessary, unavoidable, or surprise charges that inflate costs while adding little to no value
<a href="#">Motor Vehicle Dealers Rule</a>	2022; NPRM	Ban junk fees and bait-and-switch advertising tactics at auto dealers
<a href="#">Rule on the Use of Reviews and Endorsements</a>	2022; NPRM	Prohibit illicit review and endorsement practices such as using fake reviews, suppressing honest negative reviews, and paying for positive reviews
<a href="#">Non-Compete Clause Rule</a>	2023; NPRM	Prevent employers from entering into non-compete clauses with workers and require employers to rescind existing non-compete clauses
<b>Rule Reviews</b>		
<a href="#">Negative Option Rule</a>	1973; NPRM	Require “click to cancel” provision requiring sellers to make it as easy for consumers to cancel their enrollment as it was to sign up
<a href="#">Amplifier Rule</a>	1974; NPRM	Requires sellers to use uniform testing methods when advertising power output levels
<a href="#">Eyeglass Rule</a>	1978; NPRM	Require that prescribers obtain and maintain a signed confirmation after releasing a prescription to a patient
<a href="#">Business Opportunity Rule</a>	1978/2012; ANPR <sup>b</sup>	Extend Rule to include business coaching and work-from-home programs, investment coaching programs, and e-commerce opportunities
<a href="#">Energy Labeling Rule</a>	1979; ANPR	Modernize and expand the Rule’s coverage to reduce energy costs for consumers and require manufacturers to provide consumers with repair instructions
<a href="#">Funeral Rule</a>	1982; ANPR	Require funeral providers to display or distribute their price information online and through electronic means
<a href="#">Health Breach Notification Rule</a>	2009; NPRM	Clarify that Rule applies to health apps
<p>Notes:</p> <p><sup>a</sup> For regulatory actions that are “rule reviews” or amendments of existing rules, the year reflects the date of original publication of the rule. Otherwise, the year reflects the date of publication corresponding to the most recent published regulatory action.</p>		

<sup>b</sup> The rule entitled “Disclosure Requirements and Prohibitions Concerning Franchising and Business Opportunity Ventures”, promulgated in 1978, covered both franchises and certain business opportunity ventures under in a single CFR part. The FTC bifurcated this original rule into a Franchise Rule and Interim Business Opportunity Rule in 2007; a Revised Business Opportunity Rule took effect in 2012.

### C. Non-Compete Clause Rulemaking

On January 5, 2023, the FTC announced a Notice of Proposed Rulemaking (NPRM) to prohibit most non-compete clauses for workers. Non-competes are clauses in contracts between employers and workers that prohibit the worker from joining or forming a competing firm after their job ends. The NPRM outlines the legal and economic justifications for the proposed rule, and its issuance opened a comment period intended to allow the public to weigh in on those justifications (as well as the proposed rule itself). After reviewing the comments, the FTC will determine whether a final rule will be published and, if so, whether modifications should be made to the rule proposed in the NPRM.

Crafting the NPRM required substantial consideration of the extensive economic literature on non-competes, which has touched on topics such as worker outcomes,<sup>30</sup> entrepreneurship,<sup>31</sup> and innovation.<sup>32</sup> Ultimately, the goal of the analysis of benefits and costs in the NPRM was to calculate the net effects a prohibition on non-competes would have on the economy. We preliminarily found that non-competes harm labor markets and product and service markets, and we quantified and monetized, to the extent we were able, the benefits and costs associated with the enforceability of non-competes.

Evidence shows that workers’ earnings suffer when non-competes are easier for firms to enforce, even for workers who are not themselves bound by non-competes (Johnson et al., 2021). To estimate the total impact of the proposed ban on workers’ earnings, we used the two estimates from the economic literature which apply to the broadest swathes of the workforce. First, using staggered changes in the state-level laws governing non-compete enforceability, Johnson et al. (2021) find that moving to a policy of nonenforcement of non-competes (akin to the proposed rule) would increase nationwide earnings by 3.3-13.9%. Conservatively using the lower bound of 3.3%,

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<sup>30</sup> See, e.g., Lipsitz and Starr (2022), Starr (2019), and Johnson and Lipsitz (2022).

<sup>31</sup> See, e.g., Lipsitz and Tremblay (2022) and Starr et al. (2018).

<sup>32</sup> See, e.g., Johnson et al. (2023) and Baslandze (2022).

we applied this estimate to national earnings data from the Bureau of Labor Statistics to arrive at one of our estimates: finalizing the proposed rule would increase earnings by 3.3% \* \$7,577,262,960,169 = \$250 billion.<sup>33</sup> Second, Starr (2019) compares workers in occupations which use non-competes at a high rate to workers in occupations which use non-competes at a low rate, combined with cross-sectional differences in non-compete enforceability. He estimates that a one standard deviation decrease in non-compete enforceability (using a common index of enforceability—the non-compete enforceability score—for which higher values represent states in which courts more readily enforce non-competes) increases worker earnings by approximately 1%. We calculated the size of the decrease of the enforceability score in each state that would result from the proposed rule and combined that decrease with the estimate from Starr (2019) and state-level earnings data according to the following formula:

$$\sum_s [Earnings_s * (e^{-0.0099 * (Score_s - MinScore)} - 1)],$$

where  $s$  indexes states,  $Earnings_s$  represents state-level earnings from private employers in 2020 for state  $s$ ,  $Score_s$  represents the non-compete enforceability score for state  $s$  in 2014 (the most recent year with available data),  $MinScore$  represents the minimum observed score (corresponding to North Dakota, which statutorily prohibits non-competes, akin to the proposed rule), and  $-0.0099$  is the coefficient on  $\log(\text{earnings})$  from Starr (2019). Using this formula, we arrived at the second estimate: finalizing the proposed rule would increase earnings by \$296 billion. It is important to note that both estimates represent the benefits for workers, not *net* economic benefits. Some portion of the increase in worker earnings may represent transfers between workers and firms, which are distinct from net economic benefits in regulatory impact analyses.

On the product market side, quantification of benefits was more difficult, though the literature broadly agrees that non-competes hinder entrepreneurship. Since the literature on non-competes and entrepreneurship has not used a quantified scale of non-compete enforceability (instead relying on discrete natural experiments or comparisons to appropriate control groups),

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<sup>33</sup> National annual earnings of \$7,577,262,960,169 are taken from Bureau of Labor Statistics, Employment and Wages Data Viewer (last visited Dec. 9, 2022), available at [https://data.bls.gov/cew/apps/data\\_views/data\\_views.htm#tab=Tables](https://data.bls.gov/cew/apps/data_views/data_views.htm#tab=Tables). The calculation used data from private employers in 2020 (the most recent year with finalized numbers at the time of calculation).



extrapolation to the impact of the proposed rule was not straightforward. Similarly, the literature finds that non-competes increase concentration (broadly) and prices (in the healthcare sector), and generally (though not exclusively) finds that non-competes hinder innovation. Once again, however, the construction of the estimates in the literature made it difficult to monetize the impact of the rule, with one exception: linearly extrapolating the impact of non-compete enforceability on prices at physician practices, we found that health spending would decrease by about \$148 billion due to the proposed rule. Similar to the impact on earnings, some portion of this represents a transfer from physicians to patients.

Some of the costs of the proposed rule were more straightforward to monetize. Firms would face direct compliance costs (the rescission of non-competes from existing contracts and the removal of non-competes from new contracts) and may face costs related to updating their contractual practices (for example, implementing contractual provisions to protect trade secrets). Making assumptions on time usage and using available information on wage rates of attorneys and human resource specialists, the count of firms, and estimates of the proportion of firms which use non-competes, we estimated that direct compliance costs will total approximately \$281 million, and the cost for firms to update their contractual practices would be approximately \$742 million to \$1.48 billion. Another major cost discussed in the NPRM is the potential cost of lost investment. The economic literature finds that non-compete enforceability increases capital investment and worker training, and the economic benefits of those investments would be lost under the proposed rule. Like many of the benefits noted above, we were unable to quantify the size of this cost under the proposed rule.

One exercise we performed, given the inability to quantify several benefits and costs, was to ask: what percentage of the earnings increase for workers must represent a net benefit (due to, for example, more productive matching under the proposed rule than the status quo), as opposed to a transfer, to cover economic costs of varying sizes? In performing this calculation, we ignored all potential benefits stemming from increases in entrepreneurship and innovation or reductions in concentration and focused solely on labor market benefits. We found that to cover the compliance costs and the costs of updating contractual practices, 0.08% of the earnings increase would need to

represent a net benefit. To cover substantially larger costs, the percentage would need to be proportionally larger: up to 2.85% to cover a net economic cost of \$50 billion.

The public submitted over 20,000 comments on the proposed rule. While analysis of those comments is ongoing, it is our hope that the comments will allow us to sharpen our analysis of the benefits and costs of the proposed rule. We are also working to understand concerns of commenters as well as new studies that have come out since the publication of the NPRM. Indeed, in extending the comment period, we specifically requested comment on a new study (Hiraiwa et al, 2023) which finds that firms do not value legal enforceability of non-competes for certain workers. Additional information, whether from economists, other scholars, business owners, or the rest of the public, helps contribute to an analysis of the rule which is as complete and rich as possible.

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## V. Appendix – Rulemaking Details

### A. Elements of the Rulemaking Process

Most federal rulemakings, including certain types of FTC rulemakings, are governed by the notice-and-comment process under the Administrative Procedures Act (APA). Under the APA, rulemakings usually begin with a general “notice of proposed rulemaking” (NPRM), or “proposed rule”, published in the Federal Register to let the public know that it plans to commence rulemaking. The preamble of the proposed rule explains an agency’s statutory authority for rulemaking, summarizes the issues it seeks to address and why a rule is necessary, and provides the details of its proposal. The NPRM also includes the proposed “regulatory text” which sets out the amendments to the standing body of law in the Code of Federal Regulations. The NPRM also invites the public to provide comments, supporting evidence, and data to inform the rulemaking.

A key feature of many federal rulemakings is the requirement for agencies to consider both costs and benefits of the rule before implementing new regulatory actions and to make that underlying analysis public. If a rule is determined to be a “significant regulatory action”, the executive branch or cabinet-level departments and agencies are required to submit their rulemaking along with its assessment and underlying analysis of costs and benefits for review by the Office of Management and Budget.<sup>34</sup> While independent agencies, such as the FTC, are not subject to the same review and analytical requirements as the executive branch, rulemaking provisions under the FTC Act embed analytical requirements into its own rulemaking procedures.<sup>35</sup> Accordingly, rules that have “an annual effect on the national economy of \$100,000,000 or more” should include a regulatory analysis that projects benefits and any adverse economic effects or consequences, as well as that of any alternative approaches.<sup>36</sup>

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<sup>34</sup> See Section 3(f)(1)-(4) for the definition of a “significant regulatory action” in Executive Order 12866, issued September 30, 1993, available at [https://www.reginfo.gov/public/jsp/Utilities/EO\\_12866.pdf](https://www.reginfo.gov/public/jsp/Utilities/EO_12866.pdf), as amended by the April 6, 2023 Executive Order on “Modernizing Regulatory Review”, available at: <https://www.whitehouse.gov/briefing-room/presidential-actions/2023/04/06/executive-order-on-modernizing-regulatory-review/>. On January 21, 2011, Executive Order 13563, available at [https://www.reginfo.gov/public/jsp/Utilities/EO\\_13563.pdf](https://www.reginfo.gov/public/jsp/Utilities/EO_13563.pdf), reaffirmed the principles in E.O. 12866. The list of Executive Departments can be found in 5 U.S.C. § 101.

<sup>35</sup> See Section 22 of the FTC Act, which applies to all FTC rules promulgated under Sections 6 or 18 of the FTC Act, except for those “involving Commission management or personnel, general statements of policy, or rules relating to Commission organization, procedure, or practice”.

<sup>36</sup> 15 U.S.C. § 57b-3

The purpose of a regulatory analysis is to inform the development and design of the regulation with consideration of social benefits and social costs and for transparency to the public of the likely effects of the proposal. A prospective cost-benefit analysis provides a systematic approach for comparing benefits and costs of a policy intervention and uses techniques and methods from economics and statistics to predict the impacts of the rule, including any unintended consequences. The economic analysis, also commonly known as a “regulatory impact analysis” (RIA), of the proposed rule is made available for public review and comment. It is usually found either in a section of the preamble or referenced as a standalone document included in the public docket for the rulemaking.<sup>37</sup>

Before issuing a proposed rule, an agency may also gather information and increase public participation through an “advance notice of proposed rulemaking” (ANPR) in the Federal Register as a preliminary step. This may be done to engage industry, consumer groups and any other interested parties in a public dialogue on specific needs for a rulemaking or to gather additional data, when it is not yet clear what should be proposed. Any interested individual or group may submit comments on their perspectives on whether a rule is needed, concerns, and any supporting data so that the agency can consider it as part of the rulemaking record in developing the draft proposal. Under informal rulemaking procedures under the APA, which applies to rules that address “unfair methods of competition”, it would not be necessary to issue an ANPR prior to an NPRM; however, under the Magnuson-Moss Warranty – Federal Trade Commission Improvement Act of 1975, Congress imposed more stringent rulemaking procedures for rules that address “unfair and deceptive practices” as described in Section 18 of the FTC Act.<sup>38</sup> With “Section 18 rulemakings” or “trade regulation rules” that address “unfair or deceptive” practices, the FTC must issue an ANPR and take additional steps under the “Magnuson-Moss” rulemaking procedures.<sup>39</sup>

For these rules, the FTC must publish an ANPR before publishing the NPRM, as well as provide an opportunity for an informal hearing after publishing the proposed rule. The ANPR engages the public early in the process before the agency has reached its tentative conclusion on the proposal and usually includes a series of open-ended questions to which the public may respond.

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<sup>37</sup> Available at <https://www.regulations.gov/>.

<sup>38</sup> See <https://www.congress.gov/93/statute/STATUTE-88/STATUTE-88-Pg2183.pdf>.

<sup>39</sup> 15 U.S.C. 57a(a)(1)(B)



Those comments are reviewed and considered through the process of developing specific provisions for the proposal and may inform development of the preliminary regulatory impact analysis for the proposed rule.

Comments filed during the open comment period, data, and other evidence collected during the ANPR and NPRM stages contribute to the “rulemaking record”, which forms the basis for the agency’s reasoned decision-making for a final rule that would then become legally binding upon its effective date. A published final rule notice is structured similarly to the NPRM, except that it also includes the agency’s summary and assessment of significant issues raised by public comments in response to the NPRM and a final regulatory analysis. The final rule may differ from the proposed rule so long as it is a “logical outgrowth” of the approach discussed in the NPRM. As with the ANPR stage, public comments and data submitted during the public comment period for the proposed rule can be useful for filling in data gaps and informing the final regulatory impact analysis. Therefore, changes made between the proposed rule and the final rule based on consideration of public comments may also result in corresponding changes to the economic analysis of the final rule.

## B. Economic Analysis of Rulemakings

The text described five key components to the economic analysis of rulemakings. These components are discussed in more detail below.

### (1) Identifying the Need for Federal Regulatory Action

A regulatory impact analysis usually begins with a section that characterizes the nature of the underlying problem that the rule addresses and an economic rationale for why a regulatory intervention would be necessary. An economic framing of the problem involves describing any market failures, such as an externality, public goods, market power, or inadequate or asymmetric information, and the degree to which the regulatory action may correct such distortions. The proposed revisions to Circular A-4 go beyond the list of traditional sources of market failures, for example, to include behavioral biases, where there may be limitations in information processing and systematic decision-making biases, and other social purposes, such as equity and fairness considerations. The purpose of the “need for regulation” discussion is to develop the theoretical and

conceptual framework as a starting point for further examination of the evidence, data, and empirical literature on the magnitude of the problem and to determine the linkage between the proposed regulation and its potential effects. While there may be other reasons for requiring a regulatory action that are discussed in the preamble of a rule, such as a statutory mandate or other legal purposes, they may be less informative for grounding the economic analysis and identifying potential sources for welfare gains.

## (2) Defining the Analytical Baseline

All costs, benefits, and transfers of a rule are measured against a baseline representing the future state of the world in the absence of the rule, sometimes referred to as the “no action baseline”. While the status quo or current conditions are used as a proxy to forecast the future, the baseline is dynamic and should ideally account for any market trends, technological advancements, and other changes that would have occurred in the counterfactual. Selecting a time horizon for the analysis should balance the length of time needed to capture the impacts of the rule with the ability to accurately forecast the future baseline as uncertainty grows with a longer time horizon. Circular A-4 doesn’t prescribe a specific time horizon for regulatory analyses but recommends that it should be long enough to encompass most of the important effects—this would mean 10-20 years for most rules that have more immediate effects.

The baseline usually includes estimates of the number of regulated entities and industries that would be affected, the size of the market impacted, and the number of individuals affected over the period of analysis. To the extent that more granular data are available, disaggregating by subgroups and categories can be useful for refining the scope of the rule and identifying potential alternatives. If the rule addresses specific adverse outcomes, the analysis should provide evidence about those baseline risks and quantify them to the extent possible. To lay the groundwork for estimating benefits, it is important to define the baseline for any relevant endpoints, measures, and outcomes that will be used to characterize the effectiveness of a rule.

Another consideration for the baseline is the degree to which regulated entities may already comply through state and local rules, international standards and regulations, current industry best practices, or other market pressures. Since the goal of a regulatory analysis is to estimate the incremental effects attributable to the rule, any voluntary compliance, if independent of the rule,

should be reflected as part of the baseline rather than counted as an incremental effect (costs, benefits, and transfers) attributable to the rule. When the timing of voluntary compliance overlaps with announced plans for a potential rulemaking or when there has been a lot of public discourse about a forthcoming policy, it can be challenging to distinguish movement towards compliance due to anticipation of the rulemaking, in which case corresponding costs and benefits should be attributable to the rule, from compliance that would have occurred in the absence of a rule. The preamble on the proposed revisions to Circular A-4 highlights some of these issues and suggests that when there is uncertainty about the correct baseline, the impacts could be assessed against multiple baselines to determine the sensitivity of the results.<sup>40</sup>

### (3) Identifying Regulatory Approaches

In considering potential regulatory alternatives, the initial baseline analysis sets the foundation for assessing how variations and altering parameters of the rule will affect benefits and costs. Feasible regulatory alternatives should consider different ways to achieve the regulatory objectives with the least amount of burden and unintended consequences. Recognizing the practical limitations on the number of alternatives that can be realistically assessed, Circular A-4 recommends assessing at least one option that is more stringent and one that is less stringent compared with the preferred option.

If there are multiple distinct provisions or requirements within a rule, ideally the analysis would assess the costs and benefits attributable to each discrete provision. A provision-by-provision analysis of the incremental costs and benefits would facilitate a comparison of alternatives in determining which subset of provisions may be the most net beneficial. In some circumstances, the costs and benefits of individual provisions may not be distinguishable from that of others or only partially separable. It is also useful to breakdown the rule's impacts by its key provisions to show how the costs, benefits, and transfers of the rule would change if any were to be eliminated. With the goal of helping agencies identify potential regulatory alternatives that may maximize net benefits, Circular A-4 describes the following approaches and dimensions of a rule that could be varied to reduce burden:

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<sup>40</sup> Available at: <https://www.whitehouse.gov/wp-content/uploads/2023/04/DraftCircularA-4Preamble.pdf>.

- Market-oriented approaches rather than direct controls
- Performance standards rather than design standards
- Information measures or disclosures, rather than bans
- Default rules rather than mandates
- Enforcement methods
- Varying the level of stringency
- Varying compliance periods
- Modified requirements based on firm size
- Requirements based on geographic regions

#### (4) Measuring Benefits, Costs, and Transfers of the Rule and Alternatives

The regulatory analysis should describe anticipated incremental benefits, costs, and transfers associated with the preferred regulatory option and any reasonable alternatives. Estimating costs, benefits, and transfers involves predicting the behavioral changes arising from a rule's requirements and valuing those changes. The analysis should consider direct compliance costs as well as any important indirect costs attributable to the rule, such as any adverse or countervailing effects that are not captured in the direct costs. Benefits of a rule are usually favorable impacts that correspond with the overall objectives of the rule. For example, a rule that addresses information asymmetry may result in benefits that include reduced consumer search cost and welfare gains arising from eliminating any distortions in equilibrium pricing.

Benefits and costs should reflect changes in real resource use, whereas transfers reflect effects on one group that are offset by its effects on another group and do not affect net gains in social welfare. While a transfer is not counted as a net cost or benefit, the regulatory analysis should provide a separate description of the distributional effects to show whose losses may be offset by another group's gains, as well as the incidence of costs and benefits since those who bear the costs may be different than the ones accruing the benefits.

The analysis should capture all important practical effects and consequences of the rule. Circular A-4 recommends that the analysis present separate schedules of monetized benefits, costs,

and transfers to show the type and timing of undiscounted impacts. Benefits, costs, and transfers should be quantified and monetized to the extent possible. The analysis should also identify benefits and costs that can be quantified, but not monetized, including their timing. Circular A-4 recommends presenting “benefits and costs in physical units in addition to monetary units” for transparency of the analysis. For benefits and costs that cannot be quantified, the analysis should provide a qualitative description of those effects and explain why they cannot be quantified.

The following are examples of effects that should be considered, quantified, and monetized where possible:

- Private sector, including industry, compliance costs and savings
- Government administrative costs and savings
- Gains or losses in consumers' or producers' surpluses
- Discomfort or inconvenience benefits and costs
- Gains or losses of the opportunity cost of time such as work or leisure

To account for differences in timing of impacts, costs, benefits, and transfers are normalized across multiple time periods using “discount rates” and expressed as “discounted present values” and “annualized values”. The current Circular A-4 guidance recommends using two default discount rates: 3 and 7 percent. The 3 percent discount rate approximates the rate at which the average saver uses to discount future consumption based on the real rate of return on long-term government debt as measure of a “social rate of time preference” (SRTP). The 7 percent rate is an estimate of the “average before-tax rate of return to private capital in the U.S. economy” to approximate the opportunity cost of capital.

The proposed revisions to Circular A-4, which are not yet in effect at the time of this writing, suggests using the SRTP approach can be used for the default discount rate if a rule has little or no effect on capital. Using the same method to derive the 3 percent discount rate, OMB develops an updated value of 1.7 percent using the most recent 30-year average of the yield on 10-year Treasury notes adjusted for inflation. If there is substantial displacement of capital anticipated,

the proposal recommends using a “shadow price of capital” of 1 as a lower value and 1.2 as a high value to generate consumption-equivalent effects, rather than apply the 7 percent discount rate.<sup>41</sup>

The prospective nature of regulatory analyses makes it particularly challenging to quantify and monetize the anticipated consequences of a rule. The analysis should rely on “the best reasonably obtainable scientific, technical, economic, and other information to quantify the likely benefits and costs of each regulatory alternative.”<sup>42</sup> Data sources for the analysis may be publicly available or from confidential agency or proprietary data sources with the appropriate level of aggregation. While primary research and pilot studies specific to the rule’s context would be most informative for predicting the effects of a rule, usually time and resource constraints necessitate relying on existing studies and benefit-transfer methods for key parameters and values for the analysis.

Interrelationships between key parameters to develop estimates of costs and benefits may also involve making reasonable assumptions when there is a lack of data or extrapolating from similar contexts. A best practice for regulatory analysis is to ensure that all methods, data sources, assumptions, and any limitations or caveats are transparent. Specific references where available and technical appendices should be provided. When assumptions are necessary, it is important to provide the basis and rationale for those assumptions. For a preliminary regulatory impact analysis, agencies can also explicitly request public comment supported by data on any uncertain parameters and assumptions to inform changes for the final regulatory analysis. If there is uncertainty in underlying estimates or values, Circular A-4 recommends presenting a range of plausible values in addition to a “central best estimate”.

A supplemental section with an analysis of uncertainty and sensitivity could examine potential scenarios that encompasses the range of how the benefits and costs of the rule could vary. Sensitivity analysis is useful for identifying key drivers of costs and benefits and how the results change when those parameters vary. When important costs and benefits are difficult to quantify or monetize, there should be explanation of why they cannot be fully monetized and present any available quantitative information. Often it is easier to quantify and monetize compliance costs than

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<sup>41</sup> The shadow price of capital is the ratio of the gross rate of return on capital over the consumption discount rate plus the capital depreciation rate.

<sup>42</sup> Available at: [https://www.reginfo.gov/public/jsp/Utilities/circular-a-4\\_regulatory-impact-analysis-a-primer.pdf](https://www.reginfo.gov/public/jsp/Utilities/circular-a-4_regulatory-impact-analysis-a-primer.pdf).

the benefits of the rule. In such circumstances, agencies can consider conducting a breakeven analysis or threshold analysis to find the value of a key parameter that yields positive net benefits. While a breakeven analysis addresses the question of how large non-quantified benefits would need to be for total benefits to equal costs, it cannot quantify its likelihood. If feasible and appropriate, a more formal treatment of uncertainty may involve probabilistic analysis of the key uncertainties using simulation models.

(5) Summarizing the Regulatory Analysis

A regulatory analysis should include a plain language summary of the effects of the rule and include summary tables with estimates of benefits, costs, and transfers for the preferred regulatory option and alternatives considered. In organizing categories of benefits and costs, many agencies use a standardized accounting statement, as provided in the proposed revisions to Circular A-4, where private sector impacts are reported separate from those to government and reporting on distributional effects and estimates of transfers are separate from benefits and costs. Benefits and costs are further categorized as: (1) monetized, (2) quantified but not monetized, and (3) unquantified.