# Economics at the FTC: Non-Horizontal Mergers, the CARS Rule, and the Non-Compete Rule

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Abstract: 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 Bureau of Economics performs economic analysis to support the enforcement, rulemaking and policy activities of the Commission. This article discusses several examples of these activities. We first discuss analysis of non-horizontal effects of mergers, as reflected in the 2023 Merger Guidelines and in recent cases. Next, we discuss the economic analysis conducted by the FTC's economists in two recent rules. We discuss the CARS rule, a rule that aims to increase price transparency and curb misrepresentations in the marketing, sale, and leasing of motor vehicles. We next discuss the non-compete rule, which bans employers from entering into, or attempting to enter into, a non-compete clause with a worker.
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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 that is performed by the economists, financial analysts and statisticians in the Bureau of Economics (BE). The FTC is primarily a law enforcement agency that enforces 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 roughly 95 Ph.D. economists, 15 research assistants/statisticians, eight financial analysts, and four 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 that were 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 that may or may not relate directly to ongoing enforcement activities or policy initiatives. BE economists also work on more narrowly focused research projects, which are often disseminated in the form of working papers and academic journal articles.[1]

One example of a collaborative study with colleagues across the FTC is an inquiry of pharmacy benefit managers that was announced in June of 2022.[2] The Commission voted to require the six largest pharmacy benefit managers to provide information and records on their business practices to enable FTC staff to study the impact of vertically integrated pharmacy benefit

[1] A list of publications by BE economists is available at https://www.ftc.gov/about-ftc/bureaus-offices/bureau-economics/research-bureau-economics.
[2] See FTC press release, https://www.ftc.gov/news-events/news/press-releases/2022/06/ftc-launches-inquiry-prescription-drug-middlemen-industry.

managers on the access and affordability of prescription drugs. An interim report from this study was issued in July 2024.[3]

Another example is an ongoing study of physician group and healthcare facility consolidation that was announced in January 2021. The Commission voted to require six health insurance companies to provide patient level claims data that span 15 US states and the years 2015-2020. The Bureau of Economics plans to release the results of this study in a series of research papers.[4]

BE maintains connections to the academic economic research community through a weekly seminar series and by organizing the annual FTC Microeconomics Conference, which is sponsored by the Tobin Center for Economic Policy at Yale. The 2023 conference, the 16th installment, featured paper sessions, keynote addresses and panel discussions.[5] The 17th installment of the FTC Microeconomics Conference will be held on November 14-15, 2024 in Washington, DC.[6]

The FTC has been active in its investigations of mergers and antitrust conduct throughout the past year. BE economists work jointly with the lawyers and agency staff in connection with these investigations, including Amazon, Kroger-Albertsons, Temper Sealy-Mattress Firm, Exxon-Pioneer, IQVIA-Propel, John Muir-Tenet, Sanofi-Maze, Amgen-Horizon and U.S. Anesthesia Partners,[7] just to name a few. This casework often presents challenges in terms of modeling novel economic environments and/or analyzing large amounts of data.

In December 2023, the FTC, jointly with the U.S. Department of Justice Antitrust Division, released the 2023 Merger Guidelines These guidelines are a product of a process that lasted nearly

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[3] See https://www.ftc.gov/system/files/ftc_gov/pdf/pharmacy-benefit-managers-staff-report.pdf
[4] https://www.ftc.gov/enforcement/competition-matters/2021/04/physician-group-healthcare-facility-merger-study
[5] Conference materials are posted at https://www.ftc.gov/news-events/events/2023/11/sixteenth-annual-microeconomics-conference
[6] For details, see: https://www.ftc.gov/news-events/events/2024/11/seventeenth-annual-microeconomics-conference
[7] See case materials at https://www.ftc.gov/legal-library/browse/cases-proceedings/1910129-1910130-amazoncom-inc-amazon-ecommerce, https://www.ftc.gov/legal-library/browse/cases-proceedings/kroger-companyalbertsons-companies-inc-matter, https://www.ftc.gov/legal-library/browse/cases-proceedings/231-0016-tempur-sealy-international-inc-mattress-firm-group-inc-matter, https://www.ftc.gov/legal-library/browse/cases-proceedings/241-0004-exxon-mobil-corporation-matter, https://www.ftc.gov/legal-library/browse/cases-proceedings/2210196-iqvia-holdingspropel-media-matter, https://www.ftc.gov/legal-library/browse/cases-proceedings/2310054-john-muir-healthtenet-healthcare-co-matter, https://www.ftc.gov/legal-library/browse/cases-proceedings/2310091-sanofimaze-therapeutics-inc-matter, https://www.ftc.gov/legal-library/browse/cases-proceedings/231-0037-amgen-inc-horizon-therapeutics-plc-matter, https://www.ftc.gov/legal-library/browse/cases-proceedings/2010031-us-anesthesia-partners-inc-ftc-v.

two years. The 2023 Merger Guidelines replace the 2010 Horizontal Merger Guidelines and the 2020 Vertical Merger Guidelines. The primary goal of revising the guidelines was to reflect the evolution of market realities that the agencies face in merger investigations and the corresponding advances in how the agencies analyze these mergers. The 2023 Merger Guidelines achieve this goal by sharpening the tools, methods, and analyses that the agencies use to evaluate mergers and by introducing new tools.

These guidelines have already been used in litigation. For example, in successfully preventing the acquisition of two hospitals in North Carolina by Novant Healthcare, Inc., from Community Health Services, Inc., the FTC relied on the 2023 Merger Guidelines. The block of the Novant acquisition continues a long tradition of rigorous FTC enforcement of hospital mergers. The FTC also relied on the 2023 Merger Guidelines in opposing the acquisition of Capri Holding Limited by Tapestry, Inc, two manufacturers of handbags. The district court indeed relied on the 2023 Merger Guidelines in granting the FTC's request for a preliminary injunction.

In Section II of this article, we start with a discussion of mergers that might raise non-horizontal concerns. We discuss the changes in the 2023 Merger Guidelines, which replace both the 2010 Horizontal Merger Guidelines and the 2020 Vertical Merger Guidelines, and as such offer a unified treatment of all mergers. We discuss the advantages of this approach and some of the changes that it required. We then briefly discuss a few recent merger challenges that raised non-horizontal concerns. These cases illustrate the range of settings that can give rise to non-horizontal concerns. Furthermore, discussing these cases allows us to highlight some general features of the practical application of the 2023 Merger Guidelines framework.

As discussed in Ferguson et al. (2023) the FTC has been undertaking several new rulemakings in the last couple of years. In Section III we discuss the CARS rule, a rule that aims to increase price transparency and curb misrepresentations in the marketing, sale, and leasing of motor vehicles. The regulatory analysis that was included in this rule illustrates how BE economists are able to incorporate state-of-the-art research from the academic community into the FTC's rulemaking analysis. It also illustrates how BE economists deal with uncertainty. Finally, the rule nicely illustrates the relationship between consumer protection and competition. The rule is

primarily meant as a consumer protection tool, but by empowering consumers with the information they need to make informed decisions the rule also increases competition.

The non-compete rule, which we discuss in Section IV, bans employers from entering into, or attempting to enter into, a non-compete clause with a worker. Our discussion of the rule briefly summarizes the provisions of the rule, and mostly focuses on how the final rule responds to the comments that were made on the notice of proposed rulemaking, which was discussed in detail in Ferguson et al. (2023).

## II. Analysis of Mergers that Might Raise Non-Horizontal Concerns

### 1. Introduction

In recent years the FTC has paid more attention to non-horizontal concerns in its analysis of mergers. This is reflected in challenges brought, as well as in the 2023 Merger Guidelines. In this Section we discuss some of the refinements and changes made in the 2023 Merger Guidelines with respect to the analysis of non-horizontal concerns. We also survey briefly some recent enforcement actions that involved non-horizontal concerns.

Horizontal concerns can arise when the merging firms make products that compete *directly*. Non-horizontal concerns can arise when the merging firms have products that compete *indirectly* because one of the products is part of the supply chain for, or is a complement of, a rival substitute of the other product.

Prior to the 2023 Merger Guidelines, non-horizontal effects were the subject of separate guidance that was provided in the 2020 Vertical Merger Guidelines. The 2023 Merger Guidelines, instead, cover all mergers in the same document using a consistent and cohesive framework. This is important because many mergers raise both horizontal and non-horizontal concerns, as indeed, was the case in some of the recent FTC cases we describe below.

It is also important to use a consistent framework to analyze both horizontal and non-horizontal concerns because the mechanism by which these can harm competition are related. This is especially important when concerns can be analyzed as either “non-horizontal” or “horizontal”: We want the analysis to be consistent and not depend on the label put on the merger. Having a

single set of guidelines for all mergers generally promotes a consistent approach across different types of concerns, and aids in the development of a broad set of well-understood tools and methods of analysis.

In the remainder of this Section, we cover three aspects of the approach to assessing non-horizontal concerns set out in the 2023 Merger Guidelines. First, we discuss how the general burden-shifting framework of the 2023 Merger Guidelines applies. Under this framework, the initial step is to assess the risk of harm to competition before considering possible countervailing effects. Second, we describe the analytical approach to this initial step when the potential concern is foreclosure. This approach is grounded on the insight that the risk of harm to competition from foreclosure can be analyzed using methods and evidence familiar from the analysis of horizontal concerns. Finally, we discuss recent FTC cases that involved non-horizontal concerns and discuss some important practical features, including the focus on the change in incentives in general, rather than on modelling specific strategies, and the role of methods and evidence familiar from assessing horizontal effects on competition.

### 2. Burden Shifting

Mergers that have a non-horizontal component often have two aspects. First, there can be a potential loss of competition if one merging firm is part of the supply chain for, or makes a complement of, rivals of the other merging firm. The 2023 Merger Guidelines refer to the product used by rivals as the related product and are concerned with the risk that the merged firm might have the ability and incentive to lessen competition by limiting its rivals' access to the related product.

Second, there is a potential efficiency if the merging firms have a possible supply relationship themselves, or if they make complementary products. The merger might combine complementary assets and it could give the merged firm incentives to compete more aggressively if the merger eliminates double marginalization (EDM) (if the merged firms are in a supply relationship), or more generally internalizes an extremality between the firms (if they make complements).

Rather than assess all of these effects together, the 2023 Merger Guidelines recommends a staged approach that is in line with its overall framework for merger analysis.

The 2023 Merger Guidelines describe a consistent and natural flow for merger analysis. When a merger is proposed, the Agencies ask if it raises concerns under one or more of the different frameworks, or guidelines. If no concern is found the analysis ends. If there is a concern, the Guidelines proceed to identify evidence that merging parties can present to rebut or disprove an inference of potential harm under these frameworks. The Agencies then need to weigh this rebuttal evidence from the parties against the evidence that raised the concern in the first place.

In the context of assessing non-horizontal effects on competition, the burden-shifting framework means that the Agencies will first consider the risk that the merged firm will have the ability and incentive to lessen competition by limiting its rivals' access to the related product. Not all mergers will raise a concern. Below we describe, in the context of a merger between a firm and its upstream supplier, several factors that could show that such concern is unwarranted. If no concern is found, there is no need to continue the analysis. However, if there is a concern, then the analysis moves to the next step and the merging parties can present evidence to rebut or disprove this concern.

Potential benefits are not inevitable either. Consider, for example, EDM. The FTC has investigated vertical mergers that did not lead to greater vertical integration because the acquisition target made an input that the acquiring firm's rivals used but which the acquiring firm did not, or because the acquiring firm already made enough input to satisfy its own downstream demand.

Even if there is vertical integration, the merging firms might already have aligned their incentives to some extent before the merger. Several recent cases at the FTC have involved contracts where the upstream firm was compensated with a share of the downstream firm's revenue, sometimes in the form of a royalty payment. Compensation schemes that involve a revenue share align the incentives of the upstream and downstream firms to some extent because the choice of downstream price affects them both. If marginal costs are small compared to margins, or if the revenue split between upstream and downstream firms is in proportion to their marginal costs, a merger may not result in EDM at all since the downstream price that maximizes the

downstream firm's profits when acting independently is the same as the price that would maximize the joint upstream and downstream profits of the merged firm.

If an efficiency is shown, then the analysis moves to the next step of considering the net effect of the merger.

There are several practical and conceptual reasons to conduct the analysis in stages rather than jumping straight to the final step of considering the net effect on competition. Analyzing the merger following these steps ensures a consistent treatment of horizontal and non-horizontal mergers. Without such consistency it might matter whether a merger is labeled as horizontal or non-horizontal, which detracts from the economic substance.

This brings us to another important benefit of the burden-shifting approach. As we detail below, the first step of assessing the potential loss of competition involves evidence and modes of analysis that are familiar to decision makers from horizontal mergers. Assessing the overall effect of both costs and benefits, on the other hand, can be difficult: It can sometimes require significant evidence and detailed modeling. Comparing the different effects when assessed in isolation does not always provide a reliable indicator of whether the net effect is good or bad for consumers because the net result can depend on complex interactions among them (Das Varma and De Stefano (2020)). Exploring the risk of harm from lessening of competition first has the practical benefit that it focuses effort where it is warranted; there is little point in engaging in the difficult task of balancing harms and benefits unless the harm might be significant on its own.

Courts seem to struggle with models that incorporate both harm from non-horizontal effects and EDM as being detached for market realities. These struggles have mostly meant that courts are often suspicious of agencies' attempts to raise concerns about non-horizontal effects with the use of these models.

## 3. Assessing the Risk of Harm to Competition from Foreclosure

The 2023 Merger Guidelines describe several different ways in which mergers that involve vertically related products could harm competition, but one key concern is the risk that the merged firm will foreclose rivals by limiting their access to the related product. We discuss this first and

then describe a related potential concern that the merged firm will have weaker incentives to compete because it benefits when its rivals use more of the related product.

### a) The Risk of Harm to Competition from Foreclosure

The guidelines identify four factors, or questions to be answered, that will guide the agencies' analysis of the ability and incentive of the merged firm to harm competition by foreclosing rivals, each factor highlights an element as to why the merger might raise a concern. For simplicity of exposition, we pose the questions in the context of a downstream firm that merges with an input provider and we suppose that the concern is harm to competition in the downstream market. Namely, the concern is potential foreclosure, partial foreclosure, or raising the costs of rivals in the downstream market.

In this setting the questions to answer are the following:

1. Are there few alternative input suppliers that rivals could turn to if the merged firm stopped supplying them, or offered worse terms? Rivals are less likely to be adversely affected by the merged firm's attempts to limit access to its input if they have many good alternatives.
2. Is the input important, such that rivals would lose significant sales or would face significantly higher costs if their access to it were curtailed? If not, foreclosure will likely have little effect on the rivals' conduct downstream, and on the competitive conditions faced by the merged firm.
3. Are the rivals that use the input significant for competition? If not, then even if the rivals are harmed then competition may not be lessened substantially. For example, competition may not be lessened substantially, even though impacted rivals lost sales or raised prices, if competition from unaffected firms would prevent harm.
4. Is there significant competition between the merged firm and the rivals that use the input? Even if foreclosure of rivals would harm competition, the merged firm will only have an incentive to foreclose to the extent that it benefits from doing so. The merged firm's incentive to foreclose rivals depends on the extent to which it competes with them. The merged firm might have little to gain if the foreclosed

rivals do not impose a competitive constraint on it, or if the diversion of any sales the foreclosed rivals lost to the merged firm was small.

The similarity between this framework and the assessment of horizontal mergers is clearly seen in the fourth factor, which asks whether there is significant (horizontal) competition between the merging firm's downstream operations and the rivals that use its upstream input. The 2023 Merger Guidelines do not divide the factors between separate "ability" and "incentive" limbs; any split is somewhat arbitrary since the merged firm's incentive to foreclose depends on its ability to thereby affect rivals' downstream conduct. However, the fourth factor is the one that is most singularly concerned with the analysis of incentives. It builds on the observation that the merged firm's desire to limit competition from rivals is the ultimate source of its incentive to foreclose them, and this is true regardless of the specific foreclosure strategy that the merged firm might use. In essence, assessing the importance of horizontal competition provides a general way to understand the incentive to foreclose after a vertical merger.[8]

The kinship with horizontal merger analysis is even more clear if we consider the loss of indirect competition between the upstream and downstream merging firms.

Consider the following setup. Firm A competes with firm B in a downstream market, and B uses an input made by Firm C. Firms A and B compete directly; it is costly for A when B competes more aggressively and sells an additional unit because this extra sale could be at A's expense, or because A has to reduce its price to retain its own volume. A merger between A and B would internalize this externality and allow the merged firm to direct the managers of division B not to compete as aggressively.

In an analogous way, downstream firm A and the upstream firm C compete indirectly; it is costly for A when C sells an additional input to A's rival B because B might use the input to expand its output and some of these extra sales could be at A's expense. A merger between A and C would internalize this externality. The merged firm cannot require B to compete against A less aggressively, but it has an incentive to try to induce B to act less competitively through the merged firm's ability to foreclose its access to C's input. It can try to do so by denying B the input C, or by

[8] The discussion here builds on ideas that were initially developed in Moresi and Salop (2013).

raising the price of C (or worsening other terms of trade), or even by threatening to do so simply to induce B to do something it might not otherwise do.

The cost to A when C sells an additional unit to B is internalized if A and C merge, and it is a measure of the change in incentives to compete from the merger. It can be informed by the above four factors. Factors 1 and 2 examine the degree to which B is constrained if it loses (in part or in whole) access to C's product and are therefore informative about the extent to which the additional sale of inputs to B leads B to sell additional units of output. Factor 4 examines competition between A and B and is therefore informative about the cost to A when B expands output. Whether or not there is harm to competition, and not just to firm B, depends on factor 3.

### b) Pricing Incentives

The change in ability and incentive to foreclose is one possible effect in the above setting. There is another way in which that loss of competition can be harmful that is less commonly discussed, but which has been important in several FTC cases. Using the above stylized setting, when the downstream firm A competes more aggressively and wins an additional sale, it might be at C's expense: The additional sale might be diverted from B, and B might buy less input from C as a result. Eliminating indirect competition between A and C through a merger internalizes this externality and gives the merged firm an incentive to direct the downstream division A to compete less aggressively.

In other words, the merged firm may have weaker incentives to compete because it benefits when rivals expand their sales and buy more input, even if some of the rivals' sales are at the expense of the merged firm's own sales.[9] In essence, the merged firm earns a fraction of the profits generated in the vertical chain that involves the sale of a rival product that uses its input. In a way, it is if the merged firm becomes a partial owner of those profits, and the result is closely analogous to one of the ways that a partial acquisition can harm competition.[10] As described in the 2023 Merger Guidelines: "A partial acquisition can lessen competition by reducing the incentive of the

[9] This effect is discussed in Moresi and Salop (2013) as one of the potential effects of a vertical merger on the pricing incentives for the downstream merger partner's product.
[10] See Salop and O'Brien (2000) for a discussion of the competitive effects of partial ownership.

acquiring firm to compete. Acquiring a minority position in a rival might blunt the incentive of the partial owner to compete aggressively because it may profit through dividend or other revenue share even when it loses business to the rival." (2023 Merger Guidelines Section 2.11 p. 28).

The incentive to compete less aggressively downstream is also discussed in the 2023 Merger Guidelines as part of the discussion of the merged firm's overall incentives with regard to its downstream division (2023 Merger Guideline, footnote 31.) The discussion there notes that there can be two counteracting effects: an incentive to compete less aggressively downstream so as to benefit from increased input purchases by rivals, and an incentive to compete more aggressively for downstream sales because EDM makes them more profitable. There can be a net incentive to compete less aggressively, in addition to any harm to competition from foreclosure, especially if there is little or no EDM.

This is not a mere theoretical consideration. It has been an important issue in FTC cases where there was no or little EDM. It is, moreover, a source of harm that cannot be addressed by supply agreements with customers: The merged firm has an incentive to compete less aggressively downstream even if it is prevented from foreclosing rivals.

## 4. Recent cases

The FTC has recently brought several cases that involved non-horizontal concerns, which illustrate the range of settings that can give rise to these concerns. Discussing these cases allows us to highlight some general features of the practical application of the 2023 Merger Guideline framework for assessing the ability and incentive to foreclose.

One important feature of the framework is that it identifies factual issues that can be illuminated with the use of a range of qualitative and quantitative evidence and methods that are familiar from horizontal merger analysis. For example, the 2023 Merger Guidelines note that "evidence of market structure can be informative about the availability of substitutes for the related product and the competition in the market for the related product or the relevant market".[11] Also, the 2023 Merger Guidelines refer the reader to the evidence and methods listed in Section 4.2 on

[11] 2023 Merger Guidelines section 4.5.A.1.

"Evaluating Competition Among Firms" for guidance on investigating the four factors.[12] This section is also referred to in Guideline 2 on the potential loss of competition between the merging firms, and in Section 4.3 on market definition.

A framework that starts with intuitive factual questions stands in contrast to an approach to assessing vertical mergers that jumps straight to a quantitative model of a specific foreclosure strategy, which can make it difficult to give due weight to evidence about dynamic or future effects. Moreover, courts can find it difficult to give appropriate weight to what can appear to be a black box, especially when the parties point to the necessary simplifications that models entail and claim that the model is detached from "market realities".

Finally, the framework is consistent with the emphasis, in the 2023 Merger Guidelines, on evaluating the risk of harm, rather trying to predict the outcome of a merger with precision. When assessing incentives, factor 4 focuses on incentives to foreclose in general rather than on trying to predict which specific foreclosure strategy the firm might use and assessing its profitability. This has the obvious advantage that the merged firm might be able to foreclose rivals, and benefit from doing so, in different ways, and it is rarely feasible to contemplate or model all of them. Another benefit is that the framework allows due weight to be given to dynamic considerations, even if these cannot be quantified. While quantitative methods and models can be useful, they are only one part of the evidential mix rather than a necessary or central component.

We illustrate these points by discussing three recent cases. In addition to these cases, the Microsoft/Activision and Tempur Sealy International/Mattress Firm Group cases also involve non-horizontal concerns, but since both are currently in litigation, we do not discuss them here.[13]

### a) Illumina/Grail

In March 2021, the Commission issued an administrative complaint challenging Illumina's acquisition of Grail, a developer of a multi-cancer early detection (MCED) test that utilizes

[12] 2023 Merger Guidelines section 4.5.A.1.
[13] Case materials are available at: https://www.ftc.gov/legal-library/browse/cases-proceedings/2210077-microsoftactivision-blizzard-matter and https://www.ftc.gov/legal-library/browse/cases-proceedings/231-0016-tempur-sealy-international-inc-mattress-firm-group-inc-matter.

Illumina's DNA sequencing instruments as an input.[14] The principal concern was that Illumina had the ability and incentive to disadvantage Grail's rivals, which were developing potentially competing MCED tests that also utilized Illumina's instruments. By cutting off or degrading these rivals' access to Illumina's instruments, for which there were no feasible substitutes, Illumina could have undermined future competition for Grail's test, which would result in less innovation, fewer choices for patients, and possibly higher prices.

The FTC's administrative law judge found in favor of Illumina. However, in April 2023 the Commission issued its decision in the appeal of the administrative hearing's initial decision. The Commission's Opinion found that the transaction risked substantially lessening competition in the "market for the research, development, and commercialization of MCED tests" in the United States, and it ordered Illumina to divest Grail. The Commission's decision was ultimately upheld by the 5th Circuit Court of Appeals.

One striking feature of the case was that competition, if any, was nascent. The first two factors in the 2023 Merger Guidelines framework concern the upstream related product. Upstream, Illumina made the only DNA sequencing instruments that could work with Grail's MCED tests. The parties claimed that entry by new upstream rivals was imminent, but both the Commission and the 5th Circuit found persuasive evidence that this was unlikely, and that MCED test makers had no meaningful alternative to Illumina's sequencing instruments at the time, or in the foreseeable future (factor 1). Moreover, it was uncontested in the case that MCED tests had no value without compatible sequencing instruments (factor 2).

The last two factors are more concerned with competition in the downstream market. Downstream, Grail was the only manufacturer with a commercialized MCED test at the time. Any harm to competition would be seen in the marketplace only in the future (though the Court noted that lessened competition might manifest more immediately as weaker efforts to develop new

[14] Case materials are available at: https://www.ftc.gov/legal-library/browse/cases-proceedings/201-0144-illumina-inc-grail-inc-matter

products).[15] This meant there was no possibility of using current sales data to quantify diversion ratios or other parameters of interest downstream.

The parties claimed that the lack of diversion data meant that the FTC's proposed MCED market was unsubstantiated, and that competition from other types of tests that did not rely on Illumina's sequencing instruments meant that it was too narrow. On the contrary, both the Commission and the 5th Circuit relied on documentary evidence that "there is indisputably ongoing competition to bring additional products"[16] to market, and that Grail and others viewed competition between MCED tests as the key determinant of their potential sales and profits once commercialized, to find that "research, development, and commercialization of MCED tests" comprised a relevant market.[17] One consequence of this finding is that foreclosure of rival makers of MCED could have a significant effect on competition (factor 3).

Finally, both the Commission and 5th Circuit approached the analysis of incentives in a way that is consistent with the focus on the fourth factor in analyzing competition downstream between Illumina and the rivals that would be dependent on it for inputs. The Commission and the 5th Circuit did not have the option of relying on a quantitative model of a specific foreclosure strategy, because of the lack of data. Instead, they were largely agnostic as to how Illumina might hamper rivals and noted that Illumina had numerous ways in which it could hamper competition.

Further, the Commission and the 5th Circuit relied heavily on evidence on the way the merger changed Illumina's incentives to supply MCED firms with sequencing products and services: Illumina would no longer see these sales as merely a source of profit in the upstream market but would now also be aware that they could tip the playing field in Illumina's favor when competing in the emerging MCED market. For example, the Commission noted that "Illumina is well aware that vast downstream profits await the winner of the MCED innovation race and is fully cognizant of the need to position itself to capture those profits." (p. 50), and the 5th Circuit

[15] "The above evidence, combined with the extensive evidence described … above showing that GRAIL and other MCED rivals view each other as competitors, is more than enough to demonstrate that, at the commercialization phase, diversion from other tests to Illumina/GRAIL is likely if rivals are foreclosed." Commission (p. 57).
[16] *Grail LLC v Federal Trade Commission*, p.12 (5th Cir. 2023).
[17] *Grail LLC v Federal Trade Commission*, p.10 (5th Cir. 2023).

emphasized evidence that Illumina saw the transaction as a strategic pivot from focusing on upstream sales to trying to win downstream business (factor 4).[18]

In December 2023 Illumina announced that it would divest Grail, which it subsequently did in June 2024.

**b) IQVIA/DeepIntent**

In July 2023, the FTC requested that the U.S. District Court for the Southern District of New York issue a preliminary injunction to provisionally block the proposed acquisition of DeepIntent by IQVIA Holdings Inc.[19] The proposed transaction raised both horizontal and non-horizontal concerns.

DeepIntent is a healthcare-focused demand-side platform (DSP) that pharmaceutical companies (or advertising agencies that work on their behalf) employ to run programmatic digital advertising campaigns that target individual healthcare professionals (HCPs).[20] IQVIA, through its subsidiary Lasso Marketing, Inc., competed directly against DeepIntent in supplying HCP (and DTC) programmatic advertising.[21] IQVIA also supplies various HCP-related data(sets) that are key inputs into the production of those services.

In December 2023 Federal District Court Judge Edgardo Ramon ruled in favor of the FTC based on the horizontal aspects of the case. However, the FTC also argued that IQVIA would have the ability and incentive post-merger totally or partially to foreclose HCP-related data (the related products) to current or potential rivals of DeepIntent and Lasso, which would thereby substantially lessen competition in the DSP market (the relevant market).

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[18] "… the Illumina-Grail merger was the cornerstone of a foundational change in Illumina's business model…" and that "… Illumina was willing to suffer losses to its NGS-platform sales in order to accelerate the growth of its MCED-test sales because it now viewed the latter, not the former, as its primary (and far more profitable) business." *Grail LLC v Federal Trade Commission*, pp.18-19 (5th Cir. 2023).

[19] See case materials available at: https://www.ftc.gov/legal-library/browse/cases-proceedings/2210196-iqvia-holdingspropel-media-matter

[20] Programmatic advertising refers to the automated, real-time (algorithmic) bidding process that matches buyers and sellers of advertising space (or "inventories") on various Internet websites (sometimes referred to collectively as the "open web"). The FTC referred to its alleged relevant product market as "HCP programmatic advertising." This term encapsulates the various services and functionalities that are provided by healthcare-focused DSPs to run programmatic digital advertising campaigns that target HCPs.

[21] Unlike DeepIntent, Lasso did not own and operate its own DSP. Instead, it partnered with a non-healthcare-focused ("generalist") DSP, Xandr (which is owned by Microsoft) to provide its advertising services and functionalities.

Since the decision focused almost exclusively on the horizontal concerns, the public record does not contain the full range of evidence that might have been brought to bear on the non-horizontal concerns in the case. However, the FTC's Complaint highlights the role evidence on market structure can play in a vertical case. In terms of the four factors, the FTC argued that nearly all healthcare DSPs rely on IQVIA data in some capacity and that IQVIA had monopoly power in supplying HCP data (factor 1), and that the supply of high-quality HCP data is critical for healthcare DSP's ability to offer programmatic advertising (factor 2).

Moreover, the Court found that competition from other forms of digital advertising was not strong enough to prevent DSPs from constituting a relevant market. In conjunction with the point that nearly all DSPs rely on IQVIA data, this is evidence that rivals that use the data are important for competition (factor 3) and that there would be significant competition between them and the merged firm (factor 4).

**c) Ice/Black Knight**

In April 2023 the FTC filed suit in the Northern District of California for a preliminary injunction to prevent Intercontinental Exchange, Inc.'s (ICE) proposed acquisition of Black Knight.[22] ICE and Black Knight were the two largest providers of certain software products that assist lenders with the process of originating home loans for consumers.

Of particular concern were: (1) Loan Origination Systems ("LOSs"), which are software platforms that lenders use to automate all aspects of the loan origination process; and (2) Product, Pricing, and Eligibility Engines ("PPEs"), which are software applications that use characteristics of the borrower and of the property to help lenders determine what mortgage products a borrower is eligible for. ICE and Black Knight were direct competitors in both LOSs and PPEs: ICE provided the dominant LOS and Black Knight provided the leading PPE.

In addition to the loss of direct competition for these products, the proposed transaction also raised vertical concerns. Combining the dominant LOS with the leading PPE raised concerns that the merged firm would have the ability and incentive to increase the price or reduce the quality of access that PPE rivals would have to ICE's LOS platform.

[22] See case materials available at: https://www.ftc.gov/legal-library/browse/cases-proceedings/221-0142-intercontinental-exchange-incblack-knight-inc-matter

In August 2023 the FTC approved a consent order to resolve these competitive concerns. This included a divestiture of Black Knight's LOS and PPE businesses along with a number of ancillary products and other conditions to promote the success of the divested business.

The parties settled before the trial, though the Complaint highlighted the role of evidence about market structure, and about prior conduct, in establishing the vertical count.

## III. CARS Rule

### 1. Introduction

In late 2023, the FTC finalized a rule -- the Combatting Auto Retail Scams (CARS) rule -- that aims to increase price transparency and curb misrepresentations in the marketing, sale, and leasing of motor vehicles. The rule protects consumers and levels the playing field for law-abiding dealers by: (1) prohibiting misrepresentations about material information; (2) mandating certain disclosures about vehicle price, payments, and add-ons; (3) prohibiting charges for add-on products and services that would not benefit consumers; and (4) prohibiting charges unless the dealer obtains the consumer's express, informed consent. Economists in BE were charged with conducting a regulatory analysis of the benefits and costs of the rule. In this section, we provide a brief description of the provisions of the rule and summarize the analysis.

### 2. Background

The FTC receives thousands of complaints every year regarding motor vehicle sales, financing, service, and leasing, with complaint volumes placing motor vehicle dealers regularly among the top ten categories tracked by the FTC.[23] One method by which some motor vehicle dealers victimize consumers is bait-and-switch advertising: making misrepresentations about, e.g., the availability of a vehicle at a certain price only to reveal that the true price is higher near the end of the purchase process.

[23] See Consumer Sentinel Network Data Book 2021, p. 8 (listing vehicle-related complaints as the seventh most common report category, outside of identity theft, in 2021); Consumer Sentinel Network Data Book 2022, p. 8 (listing motor vehicle-related complaints as the fifth most common report category, outside of identity theft, in 2022).

Another common source of consumer aggravation relates to hidden charges for add-on products and services. Many motor vehicle dealers sell add-on products and services—including extended warranties, service and maintenance contracts, and guaranteed asset protection ("GAP") agreements—that are sometimes added to vehicle purchase or lease contracts without the consumer's knowledge or in a way that deceives consumers into thinking that they are required to purchase the vehicle.

While some commenters stated that existing Federal and State efforts are sufficient, recent Commission and partner actions indicate that misconduct has persisted despite prior law enforcement and other efforts, and despite the NPRM's detailed description of chronic problems relating to bait-and-switch tactics and hidden add-on and other charges. To address the harm these issues inflict on consumers and on law-abiding dealers, the FTC proceeded with the development of a rule.

The Dodd-Frank Act of 2010 authorized the FTC to prescribe rules with respect to unfair or deceptive practices by motor vehicle dealers. In 2022, the FTC announced a Notice of Proposed Rulemaking (NPRM) addressing unfair and deceptive practices by motor vehicle dealers. Among other things, the rule proposed in the NPRM contained provisions that would:

1. prohibit certain misrepresentations by motor vehicle dealers;
2. require disclosures of accurate price information and total of payments for finance/lease transactions;
3. prohibit the sale of any add-on that does not provide a benefit to the consumer;
4. require express, informed consent before any charges; and
5. impose recordkeeping requirements.

In December 2023, the FTC published its final rule in the Federal Register, which finalized the elements enumerated above.[24] After considering public comments, the Commission determined

[24] In early January 2024 the National Automobile Dealers Association and the Texas Automobile Dealers Association filed a lawsuit to challenge the rule, and the FTC stayed the effective date of the Rule to allow for judicial review.

not to finalize some other provisions in the final rule.[25] For a complete description of the rule and the rulemaking process, see rulemaking docket FTC-2022-0046 on Regulations.gov (https://www.regulations.gov/docket/FTC-2022-0046).

### 3. Estimated Benefits of the Final Rule

The rule provisions combine to promote enhanced price transparency, which is a primary mechanism that drives the benefits of the rule. This enhanced transparency reduces search costs and promotes price competition. In this section, we present the analysis done by BE economists to quantify certain benefits of the rule.[26]

#### a) Consumer time savings when shopping for motor vehicles

Several provisions of the rule benefit consumers by saving them time as they complete motor vehicle transactions. In particular, the disclosure of comparable prices and prohibitions on misrepresentations save consumers time when shopping for a vehicle by providing salient information early in the process and eliminating time spent pursuing misleading offers.

A starting point for the quantification of these benefits is to note that consumers who perform various activities in the vehicle buying process digitally save time at the dealership relative to those who do not.[27] Completing activities digitally saved consumers 43 minutes when negotiating the purchase price of the vehicle, 33 minutes when selecting add-ons, 45 minutes when discussing and signing paperwork, and 26 minutes when getting a trade-in offer. The regulatory analysis assumes that the rule would emulate some of the time-saving features of completing these activities digitally. For example, mandating the disclosure of comparable prices early in the shopping process will mimic the effect of discovering and negotiating prices online via websites and email. Also, the rule gives consumers confidence that they will not be surprised upon

[25] The provisions that were not finalized included a requirement for dealers to publish a price list for add-on products that would be made available at the dealership as well as on the dealer's website and a series of provisions that required itemized cost disclosures to be presented to and acknowledged by consumers at several points during the transaction.
[26] There are other benefits to the rule that we were unable to quantify and will not be discussed here; for more information, see the final regulatory analysis in the Federal Register Notice (https://www.govinfo.gov/content/pkg/FR-2024-01-04/pdf/2023-27997.pdf).
[27] See 2019 Cox Automotive Car Buyer Journey Study p. 11 (https://www.coxautoinc.com/wp-content/uploads/2019/06/2019-Car-Buyer-Journey-Study-FINAL-6-11-19.pdf).

reviewing contract paperwork, so on average they will spend less time scrutinizing contract documents and waiting for dealership staff to get approval for changes.

In the base case estimates, time savings while negotiating purchase prices under the rule are equal to those of current digital shoppers. The time savings that would be involved in selecting add-ons and discussing and signing paperwork are equal to half those of digital shoppers in the status quo. The analysis also restricts attention to only the fraction of consumers who do not shop digitally under the status quo.[28]

Finally, because the preceding figures reflect only the time saved at the dealership of purchase, BE economists included additional time savings on these activities proportional to the time spent at non-purchase dealerships. Because the average consumer visits one non-purchase dealership for each transaction and spends time there that is equal to roughly 82% of the time spent at the dealership of purchase, the analysis multiplies the time savings at the purchase dealership by this ratio to obtain the additional time saved at non-purchase dealerships.[29]

This analysis assumes motor vehicle purchase and lease transactions are held stable at the 2019 level and excludes private party, fleet, and wholesale transactions. Adding up the covered transactions (35 million) and applying the time savings calculated from the base case assumptions above, the rule will generate a total time savings of more than 72 million hours per year, which amounts to a present value of time savings between $12.3 billion and $14.9 billion, as described in Table 1.[30] This calculation ignores the time saved by consumers who would otherwise have

[28] See 2020 Cox Digitization of End-to-End Retail study p.9 (accessed at https://www.coxautoinc.com/wp-content/uploads/2021/01/2020-Digitization-of-End-to-End-Retail-Study-FINAL.pdf). Under the status quo, 20% of consumers negotiate prices online or at home, 18% select F&I products, 13% review and sign their final contract, and 31% receive a trade-in offer. While the activities listed across studies do not match perfectly, we map the activity categories to the closest corresponding activity in the other study and exclude from the time savings calculation the percentage of transactions corresponding to the fraction of consumers already engaging in that activity online.

[29] 2020 Cox Digitization of End-to-End Retail study p.4 and 2021 Cox Automotive Car Buyer Journey Study p. 16 (accessed at https://www.coxautoinc.com/wp-content/uploads/2022/01/2021-Car-Buyer-Journey-Study-Overview.pdf). The analysis implicitly assumes that: (1) the proportion of time spent at dealerships across the above activities is consistent across purchase and non-purchase dealerships; and (2) the time savings discussed above are constant as a fraction of time spent.

[30] Note that we assume that only one consumer is involved in each transaction; to the extent that multiple members of a household may visit dealerships for each transaction, these calculations are likely to underestimate the total time savings. One may also worry that the reduction in time spent on these activities leads to poorer outcomes for digital shoppers, which would offset (to some extent) these benefits. However, results across several studies suggest that the reduction in time is associated with a better experience for shoppers. See 2019 Cox Automotive Car Buyer Journey

abandoned transactions under the status quo because BE were unable to quantify the quantity of and time spent on abandoned transactions.

**Table 1—Estimated Benefits of Time Savings for Completed Transactions**

| | | 2024-2033 |
|---|---|---|
| **Completed Transactions** | | |
| *Avg. minutes saved at dealership of purchase / other dealers (by activity)*[a] | | |
| Negotiating the Purchase Price | | 34 / 28 |
| Select Finance & Insurance Add-Ons | | 14 / 11 |
| Discussing and Signing Paperwork | | 20 / 16 |
| Get a Trade-In Offer | | 0 / 0 |
| Hours saved per transaction | | 2.05 |
| Number of covered vehicle transactions per year[b] | | 34,986,253 |
| Value of time for vehicle shoppers[c] | | $24.40 |
| **Abandoned Transactions** | | ***Unquantified*** |
| **Total Quantified Benefits (in millions)** | **3% discount rate** | **$14,926** |
| | **7% discount rate** | **$12,290** |

[a] Averages are across all retail transactions; transactions where consumers performed activity digitally under the status quo will have a time savings of 0 for that activity.
[b] For total volume, National Transportation Statistics Table 1-17 (https://www.bts.dot.gov/sites/bts.dot.gov/files/2021-12/NTS-50th-complete-11-30-2021.pdf, at 21). For new vehicle retail/non-fleet fraction, Edmunds Automotive Industry Trends 2020 (https://static.ed.edmunds-media.com/unversioned/img/industry-center/insights/2020-automotive-trends.pdf). For used vehicle retail/non-fleet fraction, Cox Automotive via Automotive News (https://www.autonews.com/used-cars/used-car-volume-hits-lowest-mark-nearly-decade).
[c] BLS Occupational Employment Statistics (May 2022) and Hamermesh (2016)

Due to the uncertainty with respect to how the rule will translate into time savings for consumers, a range of alternative assumptions are included with regard to what fraction of the

Study "[Consumers] who negotiate [68% vs. 64%] and complete paperwork online [74% vs. 65%] are more satisfied with their dealership experience."; 2022 Cox Automotive Car Buyer Journey Study "More [financing] steps completed online = higher satisfaction & less time at the dealership"; Cox Automotive Car Buyer Journey Study Pandemic Edition "Higher Consumer Engagement with [Digital Retail] Improves Satisfaction With the Shopping Process".

documented time savings digital shoppers experience will be received by non-digital shoppers under the rule. Even in the low-end scenario, where the rule results in half of the consumer time savings of the base case, net benefits for the rule remain positive when holding costs constant.

**b) Reductions in Deadweight Loss**

Current practices in the industry involve shrouded prices, deception, and obfuscation, which result in search frictions that likely lead to higher prices. The rule will likely reduce prices for a number of products and services. This idea is supported by the literature. For example, Haan et al. (2018) and Moraga-Gonzalez et al. (2022) suggest that when consumers are able to observe prices for vehicles before visiting dealerships, prices and dealer profits are likely to fall. When not accompanied by changes in quantity (due to a fixed supply of the good), price adjustments serve to transfer welfare from one side of the market (e.g., dealers) to the other (e.g., consumers). A decrease in vehicle prices, however, will likely also lead to an increase in the quantity sold. This quantity expansion increases (total) welfare.

i. Framework

In the simple case where there is one good that is subject to the policy and this good has no close substitutes or complements, the welfare effect of a quantity expansion such as the one described above can be estimated with the use of only the predicted change in price, the predicted change in quantity (which can be calculated from an estimate of the slope or elasticity of the demand curve), and some information or assumption about the shape of the demand curve between points A and B.

When a good has a close substitute (such as used versus new vehicles), however, a price decrease for the good will cause demand for the substitute good to decrease. Also, in the case of automobiles, a new vehicle purchased today increases the supply of used vehicles tomorrow. As a consequence, prices in the used vehicle market will change as a result of the policy, and new vehicle price elasticities estimated under *ceteris paribus* assumptions will overstate the change in quantity that results from the policy. In addition, if used vehicles are also sold at a markup over marginal costs, then there will be an analogous reduction in deadweight loss in the used vehicle market, subject to the same considerations.

Given these complexities, the regulatory analysis follows Kleven (2021) to derive a formula for the reduction in deadweight loss from the Rule.[31] A mass of consumers $i$ with utility function $u^i\left(x_0^i, x_N^i, x_U^i\right)$ over new cars, used cars, and the numeraire (good 0) face the following budget constraint:

$$\sum_j (1+\tau_j^i) x_j^i = Y^i \ ,$$

given markups $\tau_j^i$ for good $j$ and consumer $i$ and income $Y^i$ for consumer $i$. Pre-markup prices are normalized to one so $x_j^i$ is the cost of consumer $i$'s purchase of good $j$. Total profits from the consumption of consumer $i$ are $T^i = \sum_j \tau_j^i \, x_j^i$.

Define a policy to be evaluated as $\theta$. Total welfare is defined as:

$$W(\theta) = \int_i v^i(\theta)\, di + \mu \int_i T^i(\theta)\, di \ \ .$$

Here, $v^i(\theta)$ is the indirect utility function for consumer $i$, so the first term is consumer surplus and the second term is producer surplus, while $\mu$ is the value of a dollar of profit. The change in welfare from policy $\theta$, translated into dollars by dividing by $\mu$, is:

$$\frac{dW(\theta)/d\theta}{\mu} = \int_i \frac{dT^i}{d\theta} - \frac{\partial T^i}{\partial \theta} di \ .$$

The first term is the total effect on profit from the reform and the second term is the "mechanical" effect. If we assume that quantities stay constant, the decrease in profits if the policy goes into effect. We can rewrite this as follows:

$$\frac{dW(\theta)/d\theta}{\mu} = \int_i \left[ \sum_{j=0}^{J} \tau_j^i x_j^i \frac{d \log x_j^i}{d\theta} \right] di \ ,$$

where $\frac{d \log x_j^i}{d\theta}$ is labelled the "policy elasticity" for good $j$ and consumer $i$ with respect to policy $\theta$. The following additional assumptions/simplifications are made:

1. The outside good is priced at cost;
2. All consumers face the same markups so $\tau_k^i = \tau_k$; and

[31] In the source article, the wedge between costs and prices is tax rates, but here we consider producer markups; the fundamental principles are unchanged.

3. For simplicity, all elasticities are assumed to be cost share-weighted averages of individual effects, so $X_j = \int_i x_j^i$ and $\epsilon_{jk} = \int_i \epsilon_{jk}^i \frac{x_j^i}{X_j}$.

As a result, the welfare change from the rule ($\theta$) is:

$$\frac{dW(\theta)/d\theta}{\mu} = X_N \tau_N \frac{d \log X_N}{d\theta} + X_U \tau_U \frac{d \log X_U}{d\theta}$$

On the assumption that the rule affects only markups for new vehicles, one can rewrite the "policy elasticities" as a product of a price elasticity and the elasticity of price with respect to the rule, as follows:

$$\frac{dW(\theta)/d\theta}{\mu} = X_N \tau_N \hat{\varepsilon}_{NN} \frac{d\tau_N/d\theta}{1+\tau_N} + X_U \tau_U \hat{\varepsilon}_{UN} \frac{d\tau_N/d\theta}{1+\tau_N},$$

where $\hat{\varepsilon}_{jk} = \frac{d \log X_j}{d \log(1+\tau_k)}$ is the long-run "policy price elasticity" of demand for good $j$ w.r.t. the price of good $k$, including the effects that a price change has on the prices of related goods. The formula accounts for demand feedback effects between the new and used car markets but assumes no dynamics in the path from the policy to the long-run steady-state.

Computing this formula requires estimates of seven parameters: two policy price elasticities that reflect the responsiveness of quantities of new and used vehicles sold to a change in prices in the new vehicle market after all adjustments have occurred in both markets; two baseline markups that represent the differences between prices and marginal costs for new/used vehicles; two quantities that reflect the aggregate cost of all new/used vehicles sold under the status quo; and the predicted change in prices due to the rule.

ii. Estimation

Jacobsen et al. (2021) introduce a “theoretical model of the relationships between new- and used-vehicle markets, scrappage, and total vehicle inventory" that allows for simulation of prices and quantities in these markets. Among the outputs of their simulations are the policy price elasticities required by the welfare change formula. The base case estimates of deadweight loss reduction use the long-run policy price elasticities that result from calibrating the model with intermediate values for the aggregate new vehicle and outside option demand elasticities.

Grieco et al. (2023) specify a model of the U.S. new car industry to explore trends in concentration and markups. BE economists relied on their most recent estimate of new-vehicle markups in the base case, which was 15% in 2018. This estimate reflects markups over production costs by manufacturers and not markups over the wholesale prices that are paid by dealers; but it is the wedge between retail price and production cost that matters for welfare. Without publicly available data that measure used-vehicle markups, the analysis explores two alternative cases: 1) used vehicles have no markup; and 2) used-vehicle markups are the same as new-vehicle markups.

Quantities of new- and used-vehicles sold and average prices were sourced from National Transportation Statistics, Table 1-17. As before, the analysis excludes private party, fleet, and wholesale transactions. Using these aggregate figures along with the estimate of baseline markups yields the aggregate cost of new- and used-vehicles sold in 2019.[32]

Finally, based on the academic literature on search costs in the automobile market, the rule is expected to reduce prices of new vehicles by reducing the markup that dealers are able to charge over marginal costs. BE economists identified two papers that empirically estimate the effect of price transparency or reduced search frictions on auto markups: Murry and Zhou (2020) simulate a full information counterfactual in the Ohio automobile market where search frictions are eliminated entirely and find that markups are reduced by $333. Moraga-Gonzalez et al. (2022) simulate a counterfactual in the Dutch automobile market where prices are observed prior to costly consumer search (i.e., visiting dealerships) and find that markups are reduced from 40.52% to 32.59%.

BE economists used the smaller Murry and Zhou (2020) estimate, primarily because their model is estimated using U.S. data. However, we note that Moraga-Gonzalez et al. offers evidence to suggest that significantly larger changes in markups may result from the rule.

Using these parameters obtained from the literature in combination, BE economists calculate the annual change in total welfare as:

$$\frac{dW(\theta)/d\theta}{\mu} = X_N \tau_N \hat{\varepsilon}_{NN} \frac{d\tau_N/d\theta}{1+\tau_N} + X_U \tau_U \hat{\varepsilon}_{UN} \frac{d\tau_N/d\theta}{1+\tau_N}$$

[32] Aggregate cost of good $i$ is equal to $(1-\mu_i) \times p_i \times Q_i$, where $\mu_i, p_i$, and $Q_i$ are the markup, price, and quantity sold of good $i$, respectively.

= 18% * $334,115,569,664 * -0.25 * -1% + 18% * $371,555,893,248 * -0.04 * -1% = $152,143,550 per year.

The analysis applies this annual reduction to each year of the 10-year analysis period and discounts to the present to yield a total benefit of between $1.1 billion (using a 7% discount rate) and $1.3 billion (using a 3% discount rate); see Table 2. The analysis highlights this base case but explores several scenarios that vary along two dimensions: 1) the "policy elasticity" of new- and used-vehicle demand with respect to the change in price; and 2) the existence of baseline markups in the used-vehicle market. Benefits range from $508 million under low elasticities and no used-vehicle markups to $2.3 billion under high elasticities and symmetric used-vehicle markups.

### 4. Estimated Cost of the Final Rule

Most of the costs of the rule contemplated in the regulatory analysis reflect the opportunity cost of hours spent by dealership employees in compliance activities. Some provisions impose costs that are incurred one-time when the rule takes effect. Other provisions require ongoing costs, either on an annual basis or on a per-transaction basis. Commonly, data were not available about time devoted to compliance tasks. In these cases, assumptions about the types of dealership employees that would need to be employed in compliance tasks as well as the amount of time spent were based on a review of previous regulatory analyses that featured similar requirements, with adjustments based the particulars of motor vehicle dealer operations.[33]

BE economists calculated the total amount of time spent on compliance tasks for each employee category in each year in the analysis window and monetize using wages obtained from the Bureau of Labor Statistics (BLS) Industry-Specific Occupational Employment and Wage Estimates for Automobile Dealers.[34]

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[33] See e.g., "Enhancing Airline Passenger Protections II - Final Regulatory Analysis" (Docket No. DOT-OST-2010-0140)

[34] This calculation is consistent with the assumption that the opportunity cost of hours spent in compliance activities is hours otherwise spent in other productive activities, the social value of which is summarized by the employee's wage. To the extent that these activities can be accomplished with the use of time during which employees would otherwise be idle under the status quo, our estimates will overstate the welfare costs of the rule.

As an example, for the provision that prohibits the sale of certain add-ons, the analysis assumes that each dealer will employ eight hours of compliance manager time (at a rate of $31.21) and eight hours of sales manager time (at a rate of $80.19) in the first year under the rule to cull add-ons from their offerings and to develop dealership policies regarding when certain add-ons may or may not be sold. In addition, dealers will require one hour of training per year for each of the 417,110 sales and related employees across the industry to apprise them of these policies and their obligations under the rule. These hours spent in compliance tasks were then multiplied by the relevant employee wages to obtain a total compliance cost of between $128.3 million and $146.8 million, depending on the choice of discount rate. For several provisions, higher-cost scenarios were also included to reflect alternative compliance regimes.

### 5. Sensitivity Analysis

To account for uncertainty in some of the parameters, the regulatory impact analysis includes two sensitivity analyses. The first sensitivity analysis is a Monte Carlo exercise where, in each simulation, many parameters in the benefit and cost model were drawn from distributions typically centered on the base case parameter value.[35] This procedure characterizes the uncertainty around the central estimate of net benefits on the assumption that the base model was specified correctly. The second sensitivity analysis examines robustness to the possibility of systematic underestimating of labor costs.

The Monte Carlo analysis simulates 1,000 scenarios that draw from specified parameter distributions and differences the costs and benefits from each iteration to yield a distribution of net benefits under the various parameter draws. The result is presented in Figure 1, for two different discount rates. This exercise reveals heterogeneity in net benefits under the alternative parameter distributions, but the rule still yields positive net benefits in all simulated outcomes.

[35] Distributions for durations, either amounts of time that dealership employees spend or amounts of time that consumers save, were centered on the parameters that were used in the main text and drawn from a symmetric, triangular distribution around the base case assumption with a specified upper and lower bound. Elsewhere, as with assumptions about fractions or proportions, our base case was often an extreme case, 0 or 1. In these cases, deviations were typically not centered on the base case and were allowed to vary across the whole range as dictated by the parameter. All draws were independent. For details, please consult the final regulatory analysis in the Federal Register Notice (https://www.govinfo.gov/content/pkg/FR-2024-01-04/pdf/2023-27997.pdf).

In the second sensitivity analysis, all labor costs were assumed to be ten times larger than the base case. As a result, costs increase from $1 billion to $9.4 billion, which reduces the net benefits from $12.3 billion to $3.9 billion (using a 7% discount rate). While the net benefits decrease in this exercise, they are still positive and meaningful. Details of these sensitivity analyses can be found in in the final regulatory analysis in the Federal Register Notice.

## 6. Concluding Comments

Using the base case estimates from the analysis, the present value of quantified benefits for consumers from the rule's requirements over a 10-year period using a 7% discount rate is estimated at $13.4 billion. The present value of quantified costs for covered motor vehicle dealers of complying with the rule's requirements over a 10-year period using a 7% discount rate is estimated at $1.1 billion. This generates an estimate of the present value of quantified net benefits equal to $12.3 billion using a discount rate of 7%.

Using the best (or worst) case assumptions discussed in the preceding analysis results in net benefits of $21.2 billion (or $5.5 billion) using a discount rate of 7%. While there are certain benefits and costs that remain unquantified in the analysis, unquantified benefits are expected to outweigh unquantified costs for this rule. As a result, the regulatory analysis indicates that the rule will result in benefits to the public that outweigh the costs.

**Figure 1**

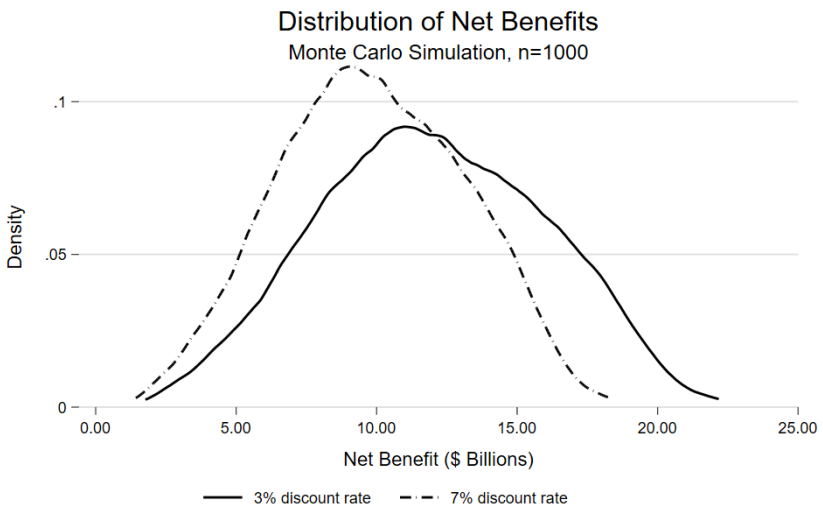


**Table 2: Present Value of Net Benefits (in millions), 2024–2033**

| | Low Estimate | | Base Case | | High Estimate | |
|---|---|---|---|---|---|---|
| | **3% Discount Rate** | **7% Discount Rate** | **3% Discount Rate** | **7% Discount Rate** | **3% Discount Rate** | **7% Discount Rate** |
| *Benefits* | | | | | | |
| Deadweight Loss Reduction | $568 | $468 | $1,298 | $1,069 | $2,307 | $1,899 |
| Time Savings | $7,463 | $6,145 | $14,926 | $12,290 | $24,036 | $19,790 |
| **Total Benefits** | **$8,031** | **$6,613** | **$16,224** | **$13,359** | **$26,343** | **$21,690** |
| **Total Costs** | **$1,270** | **$1,075** | **$1,270** | **$1,075** | **$559** | **$474** |
| **Net Benefits** | **$6,761** | **$5,538** | **$14,954** | **$12,284** | **$25,784** | **$21,216** |

Note: "Low Estimate" reflects all lowest benefit estimates and high cost scenarios and "High Estimate" reflects all highest benefit estimates and low cost scenarios. "Base Case" reflects base case benefit estimates and high cost scenarios. Comprehensive sensitivity analyses are not included. Not all impacts can be quantified; estimates only reflect quantified costs and benefits.

## IV. Non- Compete Rule

Non-compete clauses are contractual provisions between employers and workers that prohibit workers from joining or forming competing firms after their jobs end. The economic literature has considered several ways that non-compete clauses affect economic outcomes, including worker outcomes,[36] entrepreneurship and competition,[37] and innovation.[38]

On January 5, 2023, the FTC issued a Notice of Proposed Rulemaking (or NPRM) to ban employers from using non-compete clauses in their agreements with their workers. Following issuance of the NPRM, the FTC received comments from the public on the rule. On April 23, 2024, the FTC announced the finalized Non-compete Rule. The final rule is generally similar to the proposed rule, though the final rule excludes from its coverage preexisting non-compete clauses with senior executives.[39]

The economic analysis of the costs and benefits of the rule contains many components, which correspond to the rich economic literature on non-compete clauses, are discussed in depth in Ferguson et al. (2023) and are briefly summarized here. The benefits of the rule include increases in worker earnings, improvements in innovation, and reductions in consumer prices. Non-compete clauses decrease worker earnings by generating friction in the labor market, which prevent workers and firms from forming optimal matches through labor market churn and by impairing the bargaining position of workers. Based on estimates from the economic literature, the FTC estimates that worker earnings will increase by $53 to $234 billion per year.

Furthermore, non-compete clauses prevent labor market churn among knowledge workers, and therefore inhibit fruitful idea recombination across firms that benefits innovation. The FTC estimates that the rule will generate tens of thousands of additional patents over the next ten years.

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[36] See, e.g., Johnson, Lavetti, and Lipsitz (2023); Lipsitz and Starr (2022); Johnson and Lipsitz (2022); Balasubramanian et al. (2022); Garmaise (2011); Starr (2019).
[37] See, e.g., Hausman and Lavetti (2021); Lipsitz and Tremblay (2022); Starr et al. (2018); Jeffers (2024); Shi (2024).
[38] See, e.g., Johnson, Lipsitz, and Pei (2023); Rockall and Reinmuth (2023); Samila and Sorenson (2011).
[39] On August 20, a district court issued an order stopping the FTC from enforcing the rule. The FTC has appealed that decision. The district court's decision does not prevent the FTC from addressing non-compete clauses through case-by-case enforcement actions.

Finally, by preventing competition-enhancing entrepreneurship, non-compete clauses increase consumer prices. Using estimates of the effect of non-compete clauses on prices for physician and clinical services (the one industry for which estimates are available[40]), the FTC estimates that the rule will reduce healthcare spending by $74-194 billion over ten years.

The potential costs of the rule include possible reductions in productivity associated with lost training, legal and administrative costs, and potential increases in litigation. Non-compete clauses may encourage worker training by solving a holdup problem, wherein firms are unwilling to invest in workers without assurance that the firm will receive a return on its investment. The rule may therefore reduce investment in training and cause productivity losses. However, as discussed below, an alternate explanation for empirically observed training increases associated with non-compete clauses is that less-experienced workers must be hired due to non-compete clauses, which implies that increases in training can represent economic inefficiencies.

Legal and administrative costs associated with the rule arise from the requirement that contracts not contain non-compete clauses, and that workers (other than senior executives) previously bound by non-compete clauses would need to be notified that the clauses are no longer enforceable. While non-compete clause litigation may decrease due to the rule (since it creates a bright line, and thereby diminishes uncertainty), it is possible that litigation related to trade secrets may increase. The rule discussed these costs.

In response to comments, several changes were made to improve the analysis and to ensure transparent, conservative, and complete estimates of the costs and benefits of the rule. In the remainder of this section, we describe the major changes made to the economic analysis between the NPRM and the final rule.

### 1. Analytical Framework for Assessing Empirical Studies

BE economists who worked on the rule conducted a thorough review of the economic literature. To ensure transparency and consistency, the rule introduces five principles that guide how the economists assess the economic literature and give more weight to certain studies. These

[40] Hausman and Lavetti (2021).

principles are based on best economic and econometric practices but are also specific to the econometric issues in examining the effects of non-compete clauses.

First, the analysis gives more weight to studies that leverage changes in the enforceability of non-compete clauses for identification of its effects, rather than comparisons of workers who have non-compete clauses to workers who do not. Studies that focus on the latter may find results driven by confounding variables.

For example, a worker whose job necessitates access to trade secrets may have higher productivity than a worker without such access, which leads to higher pay. To protect those trade secrets, a firm may use a non-compete clause. However, the non-compete clause did not necessarily cause higher pay (or higher productivity), and an inability to use a non-compete clause would not necessarily diminish the worker's pay or productivity.

On the other hand, changes in the enforceability of non-compete clauses allow for estimation of the effect using difference-in-differences. In papers that use this strategy, the first difference is a comparison of economic outcomes in a U.S. state before and after a legal change in the enforceability of non-compete clauses in that state The second difference is across states: a comparison with control states that have had no change in the enforceability of non-compete clauses. The literature has shown that such changes in enforceability tend to be exogenous to political, economic, and business conditions,[41] which supports the validity of the conclusions of such analyses.

Second, the analysis gives more weight to studies that leverage changes in the enforceability of non-compete clauses, rather than using cross-sectional differences in enforceability of non-compete clauses (as opposed to the presence or absence of non-compete clauses, which is covered by the first principle). Using cross-sectional differences in legal enforceability risks conflating the effects of a multitude of other policies and characteristics with the effects of a policy of enforcing non-compete clauses.

Third, the analysis gives more weight to studies that consider several changes in the enforceability of non-compete clauses (for example, across many states and at many points in time, as opposed to just one legal change in one state). In difference-in-difference designs that leverage

[41] Johnson, Lavetti, and Lipsitz (2023).

policy changes for certain groups (such as businesses or workers in certain states, in this context), statistical power comes from more groups' being treated. Case studies such as examinations of legal changes in a single state, while relevant, were therefore given less weight.

Fourth, the analysis gives more weight to studies with better measures of the enforceability of non-compete clauses. The literature has considered several approaches with respect to measuring the enforceability of non-compete clauses. Some studies simply measure whether a legal change made non-compete clauses more or less enforceable. Other studies consider several dimensions of enforceability and characterize, using a binary variable, whether or not states reach certain benchmarks on each dimension. The most granular studies consider several dimensions of enforceability and characterize where states fall along those dimensions using a continuous scale. The legal literature considers this last method to be the strongest approach to measuring enforceability.[42]

Finally, the analysis gives more weight to studies in which the measured economic outcome corresponded closely to the outcomes with which the FTC was primarily concerned. For example, innovation is a difficult outcome to measure. Researchers tend to use proxies such as counts of patents or citation patterns. However, these proxies may miss important unpatented innovation. Studies that bolster the analysis of patents or citation patterns with additional variables that measure innovation were given more weight than those that simply register patent counts.

These principles, together with the expertise of the BE economists, guided the way the FTC treated the vast body of empirical evidence on which the rule was based. While the ultimate treatment of studies did not differ much from the proposed rule, laying out these principles, in a clear and transparent way, demonstrates the rigor of the analysis that supports the rule.

### 2. Estimating the Economic Impact of the Rule on Investment in Human Capital

The NPRM discussed the possibility that the proposed rule would decrease investment in human capital. In theory, by solving a holdup problem on the part of firms, non-compete clauses may incentivize investment in human capital. Specifically, if a firm worries that workers may walk out the door after receiving costly, firm-sponsored, productivity-enhancing training, then the

[42] Bishara (2010); Barnett and Sichelman (2021).

employer may, in theory, not be willing to invest in such training in the first place. If a non-compete clause increases the likelihood that a worker will stay at the job, then it might theoretically solve the holdup problem, and therefore lead to increased investment. Critics argue, therefore, that the rule would discourage human capital investment and therefore lead to economic costs.

One complex economic issue related to training discussed in the final rule is the mechanism that underlies decreases in training associated with decreases in the enforceability of non-compete clauses. Empirical analysis in the economic literature finds that lower non-compete enforceability leads to lesser investment in worker training.[43]

The rule's final analysis explains that there are two possible explanations for such a decrease. First, it may be that non-competes serve as a solution to a hold-up problem, as described above. Second, it may be that non-competes hinder firms from hiring experienced workers (who may, for example, take career detours in other industries to avoid the reach of a non-compete[44]), causing those firms to hire from a pool of inexperienced workers and therefore necessitate increased rates of basic training.

If the first explanation -- the "advanced training" scenario -- is correct, then training associated with non-compete clauses is productivity-enhancing, relative to the counterfactual world in which non-compete clauses are prohibited, because workers will be trained at a greater rate than without non-compete clauses. If the second explanation -- the "core training" scenario -- is correct, then training may not enhance productivity, because it is necessary to get workers to the level at which the workforce would be in the absence of non-compete clauses.

In practice, the empirical literature has not determined which of these two explanations is correct, and, of course, some combination may be possible. To address this concern, the analysis in the final rule estimates a range of effects, taking these two explanations as endpoints.

The analysis of the effect of the rule on human capital investment focuses on three components: (1) the lost productivity from less training; (2) the gained productivity from less time spent training (the opportunity cost of training); and (3) the saved direct outlay on training expenses. For each component, the estimation of the effect contains some uncertainty: The

[43] Starr (2019).
[44] See Marx (2011) and Mueller (2024) for evidence that workers take career detours in response to non-competes.

empirical paper that examines the underlying estimates for these effects reports the differential impact of the enforceability of non-compete clauses on high-use occupations versus low-use occupations.[45]

To obtain an absolute measure of the effect, one must therefore assume the base rate. The rule provides results based on two assumptions: first, that there is no effect of the enforceability of non-compete clauses on worker training for workers in low-use occupations; and second, that the differential effect represents the average overall effect.

To estimate the first component, which occurs only in the advanced training scenario, the analysis uses the following formula:

*Lost Output from Lost Investment in Human Capital = (Total # of Affected Workers) * (Percentage Point Decrease in Trained Workers) * (Average Hourly Output of Workers) * (Average Hours Worked per Year) * (% Productivity Loss).*

The analysis calculates the second component, additional output due to less time spent training, as follows:

*Additional Output of Workers Resulting from Less Time Spent Training = (Total # of Affected Workers) * (Percentage Point Decrease in Trained Workers) * (Average Hours Spent Training Per Worker) * (Average Hourly Output of Workers).*

The analysis calculates the third component, reduced direct outlays on training, as follows:

*Reduced Direct Outlays = [(Total Direct Outlays) / (# of Workers Receiving Training)] * [(Total # of Affected Workers) * (Percentage Point Decrease in Trained Workers)].*

In each case, the calculation is a straightforward accounting of the dollars gained or lost due to the rule, where each constituent piece is derived from estimates in the literature or published national statistics.[46] Altogether, the ten-year discounted estimated effect of the rule on investment in human capital ranges from a net cost of $14-41 billion to a net benefit of $12-32 billion. Whether

[45] Starr (2019).

[46] Total number of affected workers: Starr et al. (2021). Percentage point decrease in trained workers: Starr (2019). Average hourly output of workers: estimated using data in the Survey of Income and Program Participation. Average hours worked per year: https://fred.stlouisfed.org/release/tables?rid=50&eid=6462#snid=6449. Percentage productivity loss from lost training: Frazis and Loewenstein (2005) and Kambourov, Manovskii and Plesca (2020). Average hours spent training per worker: Frazis and Spletzer (2005). Total direct outlays: 2022 Training Industry Report, Training Magazine. Number of workers receiving training: Frazis and Spletzer (2005). For full details of each calculation, see the final rule.

the effect is a cost or benefit of the rule depends on whether lost training is core or advanced. The ranges of uncertainty inside each estimate represent different discount rates (2%, 3%, and 7%) and the different assumptions about the affected population (workers in high non-compete use occupations only, or all workers).

### 3. Estimating the Economic Impact of the Rule on Worker Earnings

The empirical literature demonstrates that enforceability of non-compete clauses reduces worker earnings across a variety of geographies and jobs, including low-wage workers,[47] high-tech workers,[48] CEOs,[49] and in a national sample covering a broad swathe of the workforce.[50] Economists hypothesize that this effect occurs when non-compete clauses are prevalent and enforceable due to the inability of workers to sort into their highest productivity matches and due to the inability of workers to leverage outside options to bargain for earnings increases or move to higher paying jobs. In the NPRM, the FTC used estimates from the economic literature to estimate the annual effect of the rule on worker earnings, approximately $250 billion per year.

Commenters stated that the approach used by the FTC relied too heavily on a linear extrapolation.[51] In particular, the approach assumed that the negative percentage effects on earnings of a large change in the enforceability of non-compete clauses (such as that induced by the rule) are directly proportional to the effects of small changes (such as those used to produce estimates in the literature). While this may be a reasonable assumption (and, indeed, is supported by analysis in the literature),[52] the final rule relies on a more conservative analysis as the primary analysis, though an analysis comparable to the one contained in the NPRM is also presented.

The baseline approach the FTC took assumes that the effect of the rule would be identical to the effect of a change in enforceability with magnitude equal to the average of the absolute value of the size of all changes in the enforceability of non-compete clauses observed between 1991 and 2014. Johnson, Lipsitz, and Pei (2023) estimate that the average absolute value of a change in the

[47] Lipsitz & Starr (2022).
[48] Balsubramanian et al. (2022).
[49] Garmaise (2011).
[50] Johnson, Lavetti, and Lipsitz (2023).
[51] See, e.g., https://www.regulations.gov/comment/FTC-2023-0007-20841.
[52] Johnson, Lavetti, and Lipsitz (2023).

enforceability of non-compete clauses over that period was approximately 0.08 on a scale running from zero to one. A change of magnitude 0.08 is meaningful, but somewhat small when compared with the effect on enforceability that the rule will precipitate. For example, a change of 0.08 would arise if a court -- without opining on any other facets of enforceability -- found that the mere provision of a job absolutely did not constitute sufficient consideration (i.e., compensation) for the signing of a noncompete clause when law prior to that decision held that it very likely did.

To quantify the impact of a change in the level of enforceability on the estimated effect on worker earnings under this approach, the FTC used an estimate from the study with the broadest coverage of the workforce.[53] That estimate indicates that moving from the highest observed enforceability in the United States from 1991 to 2014 to the lowest would increase aggregate worker earnings by 10.1%[54] Conservatively, taking this 10.1% to be the effect of the biggest possible change in enforceability, we scale that down by 0.08 to estimate the impact as if the rule had the effect of the average change in enforceability to get an estimated effect of the rule on worker earnings of 0.86%.[55]. The FTC therefore estimates that aggregate worker earnings would increase by $53 billion per year, which was calculated as $53 billion = 0.86% * $6.2 trillion. Here, $6.2 trillion represents an estimate of total annual earnings for workers who: (a) are covered by the rule;[56] and (b) do not live in states that already broadly do not enforce non-competes.[57]

This approach may generate a substantial underestimate of the effect of the rule because the average-sized change in the enforceability of non-compete clauses is an order of magnitude smaller than the change the rule will precipitate.[58] As an alternate approach, the final rule maintains the approach used in the NPRM. In particular, Johnson, Lavetti, and Lipsitz (2023) calculate the change in each state's enforceability score that would result from a prohibition on non-competes, multiply their coefficient estimate by those changes, and combine to calculate the percentage change in national earnings. After adjusting for the fact that Minnesota now bans non-competes

[53] Johnson, Lavetti, and Lipsitz (2023).
[54] Calculated as -10.1% = exp(-0.107)-1 based on a coefficient of -0.107 in Johnson, Lavetti, and Lipsitz (2023).
[55] Calculated as -0.86% = exp(-0.107*0.081)-1.
[56] In the analysis of benefits and costs, the FTC conservatively estimated that approximately 80% of the US workforce is covered by the FTC's jurisdiction, which excludes government workers, certain non-profits, and certain industries.
[57] These states are California, Minnesota, North Dakota, and Oklahoma.
[58] Note that most states' scores are greater than 0.5, and the rule effectively moves those scores to zero.

(but did not during the period that Johnson, Lavetti, and Lipsitz use to calculate the percentage change), the analysis in the rule multiplies by affected national earnings, which results in an estimated annual increase in worker earnings due to the rule of $234 billion per year.

### 4. Estimating the Economic Impact of the Rule on Innovation

The NPRM contained a discussion of papers that examine the relationship between non-compete clauses and innovation. There is a theoretical tradeoff with respect to the relationship between non-competes and innovation. On the one hand, in theory, non-compete clauses may solve a hold-up problem wherein firms are less willing to invest in research and development (R&D) if they worry that workers may be able to appropriate some of the rents generated by that investment by threatening to leave for a competitor. On the other hand, churn of knowledge workers between knowledge firms may lead to idea recombination that results in innovation greater than the sum of its parts.

The literature, including two papers released after publication of the NPRM,[59] broadly agrees that while there is evidence of both effects, the latter effect strongly dominates: Non-compete clauses diminish innovation. However, the NPRM did not quantify or monetize this effect in the analysis of economic costs and benefits, and commenters stated that the FTC should push further in monetizing important costs and benefits.[60]

Similar to the approach for worker earnings, the analysis in the rule quantifies this effect by conservatively assuming that the rule will decrease the enforceability of non-compete clauses by the same amount as the average observed change in enforceability at the state level. Applying coefficient estimates from Johnson, Lipsitz, and Pei (2023) that grow over time, the rule estimates that new patenting (one measure of innovation) will rise by approximately 3,000 to 5,000 in the first year after the rule goes into effect, and by approximately 31,000 to 53,000 by the tenth year.

The rule also estimates the effect on R&D expenditure. A decrease in R&D expenditure may indirectly be a net cost (since, ceteris paribus, that decrease may lead to decreased innovation). The decrease caused by the rule may represent a benefit, however, since innovation is directly estimated to grow, and this estimate accounts for the negative effect on R&D expenditure. The

[59] Johnson, Lipsitz, and Pei (2023); Rockall and Reinmuth (2023).
[60] See, e.g., https://www.regulations.gov/comment/FTC-2023-0007-20753.

overall effect (estimated with substantial uncertainty due to conflicting estimates in the literature) is a reduction of R&D expenditure of $0 to $47 billion per year.

### 5. Breakeven Analysis for Innovation and Earnings

The NPRM left several costs and benefits unmonetized and therefore it did not calculate the total monetary value of the economic cost or benefit. This is also true in the final rule, due to unavailability in the economic literature of parameters necessary to arrive at such estimates. For example, it is likely that the rule will reduce litigation over non-compete clauses, since it draws a bright line that should not require a court's interpretation. On the other hand, commenters indicated that they expect trade secret litigation to rise due to the rule.[61] The net effect on litigation, as well as the cost of lost or gained litigation, has not been estimated in the literature, which left the FTC unable to quantify the net effect.

For two outcomes, monetization of estimated effects required only one additional parameter, which allowed the FTC to conduct a breakeven analysis in the final rule. The fundamental question answered by this analysis is what would the value of unknown parameters needs to be for the rule to have zero net benefit or cost?

The analysis is conducted for two parameters with unknown values. The first parameter is the percentage of increases in worker earnings that represent an economic benefit (rather than a transfer). Put differently, some of the estimated increase in worker earnings due to the rule may simply reflect greater bargaining power on the part of workers compared with their employers in which case every dollar increase in worker earnings would represent a dollar decrease in firm profit. On the other hand, the rule may diminish deadweight loss by increasing the match quality between workers and firms, and therefore increase worker productivity, which would pass through to workers as an earnings increase. The latter represents an economic benefit, whereas the former is a transfer from employers to workers.

While there is no literature to draw on to estimate the percentage of increases in worker earnings that represents a benefit, there is reason to believe that some of the increase represents

[61] A recent empirical paper sheds doubt on this hypothesis: Greenwood, Kobayashi, and Starr (2024) find that reductions in noncompete enforceability lead to, if anything, *reductions* in trade secret litigation, without corresponding decreases in the actual use of trade secrets.

benefits. Non-compete clauses have been shown to induce negative externalities, such as from labor market spillovers (by inducing frictions in labor markets) or lost entrepreneurship (which enhances labor market competition). Eliminating these externalities would increase labor market efficiency, which would increase workers' earnings and increase output.

The other parameter is the monetized social value of an additional patent. The empirical literature has demonstrated that reduced enforceability of non-compete clauses increases the quantity (and quality) of patents,[62] but no estimates exist that quantify the value of an additional patent to society (which, in addition to the private value to a patenting company, may include follow-on innovation or other innovation spillovers). There are, however, estimates in the literature of the private value of a patent to certain actors. The rule uses the estimates of the private value—which range quite broadly from $94,886[63] to $32,459,680[64]—as benchmark estimates of social value.

Under reasonably low values of each of these two parameters, the rule breaks even. For example, assuming that none of the earnings effect of non-competes represents a benefit, the social value of a patent needs to be only $297,144, which orders of magnitude below many estimates of the private value of a patent in the literature. Similarly, assuming that the social value of a patent is only $94,886—the lowest available estimate—only 5.5% of the earnings effect of the rule must be a benefit, rather than a transfer, for the rule to break even.

## V. Conclusion

In this article we discuss some of the work done by BE economists. Specifically, we discuss: (1) analysis of non-horizontal effects of mergers, as reflected in the 2023 Merger Guidelines and in recent cases; (2) the economic analysis conducted by BE economists in the CARS rule, a rule that aims to increase price transparency and curb misrepresentations in the marketing, sale, and leasing of motor vehicles; and (3) the economic analysis conducted by BE economists in the non-compete

[62] Johnson, Lipsitz, and Pei (2023); Rockall and Reinmuth (2023); He (2024).
[63] Richardson Oliver Insights; see https://www.roipatents.com/secondary-market-report.
[64] Kogan et al. (2017).

rule, which bans employers from entering into, or attempting to enter into, a non-compete clause with a worker.

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