

FTC v. META: THE IMPORTANCE OF QUANTITATIVE EVIDENCE IN ANTITRUST



BY DENNIS W. CARLTON, JOHN A. LIST, ALLAN SHAMPINE, HAL SIDER & THERESA SULLIVAN¹

¹ Dennis W. Carlton is the David McDaniel Keller Professor of Economics Emeritus at the Booth School of Business at the University of Chicago, and Senior Managing Director at Compass Lexecon; John A. List is the Kenneth Griffin Distinguished Service Professor in the Department of Economics at the University of Chicago and an affiliate of Compass Lexecon; Allan Shampine, Hal Sider, and Theresa Sullivan are Executive Vice Presidents at Compass Lexecon. The authors worked on behalf of Meta in connection with *Federal Trade Commission v. Meta Platforms, Inc.* We thank the entire teams at Compass Lexecon and at Kellogg, Hansen, Todd, Figel & Frederick for their help during the preparation of the *Meta* case. This paper reflects the views only of the authors and not necessarily any other firm. Neither Meta nor the Kellogg law firm provided financial support for this paper. The authors received no financial compensation for the preparation of this paper.

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The Federal Trade Commission ("FTC") brought an antitrust lawsuit against Meta in 2021, claiming that Meta's acquisitions of Instagram and WhatsApp had allowed it to monopolize a relevant market for apps providing "Personal Social Network Services" and that consumers had been harmed because the acquisitions allowed Meta to increase ad loads imposed on Facebook and Instagram app users. However, the FTC's market definition was not based on quantitative evidence and its assertion of harm ignored the two-sided nature of the Meta platforms, which makes it impossible to determine whether a merger would increase ad loads based on theory alone. In contrast, Meta's economic experts used modern theoretical and quantitative tools of economic analysis to address market definition and competition issues. This paper summarizes the field experiment, natural experiments, and related quantitative analyses presented by Meta's economic experts that demonstrated the FTC's market definition excluded apps that were closer substitutes to Meta's apps than the included apps. The paper also summarizes the results of a de-merger simulation that accounted for the two-sided nature of apps and was based in part on the results of the field experiment. That analysis demonstrated that the FTC's claim that the acquisitions had led to increased ad load was not supported by the data.

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The Federal Trade Commission (“FTC”) brought an antitrust lawsuit against Meta in 2021, claiming that Meta’s acquisitions of Instagram and WhatsApp had allowed it to monopolize a relevant market for apps providing “Personal Social Network Services” and that consumers had been harmed because the acquisitions allowed Meta to increase ad loads imposed on Facebook and Instagram app users. However, the FTC’s market definition was not based on quantitative evidence and its assertion of harm ignored the two-sided nature of the Meta platforms, which makes it impossible to determine whether a merger would increase ad loads based on theory alone. In contrast, Meta’s economic experts used modern theoretical and quantitative tools of economic analysis to address market definition and competition issues. This paper summarizes the field experiment, natural experiments, and related quantitative analyses presented by Meta’s economic experts that demonstrated the FTC’s market definition excluded apps that were closer substitutes to Meta’s apps than the included apps. The paper also summarizes the results of a de-merger simulation that accounted for the two-sided nature of apps and was based in part on the results of the field experiment. That analysis demonstrated that the FTC’s claim that the acquisitions had led to increased ad load was not supported by the data.

I. INTRODUCTION

After a nearly two-year investigation, the FTC sued Facebook (now Meta) in early 2021 under Section 2 of the Sherman Act, claiming that Facebook’s acquisitions of Instagram (in 2012) and WhatsApp (in 2014) enabled Facebook to acquire and maintain a monopoly in the market for “Personal Social Network Services” (“PSNS”). The FTC claimed that the PSNS market consisted principally of Facebook, Instagram, and Snapchat,² and that Facebook’s acquisition of Instagram eliminated a nascent PSNS rival and its acquisition of WhatsApp eliminated a potential rival. The FTC market definition did not account for the multi-sided nature of the industry, focusing on users alone and ignoring the role of advertisers. According to the FTC’s theory, the acquisitions harmed consumers by raising ad loads (the share of posts that are ads) and inhibiting innovation. After a two-month trial in the Spring of 2025, Judge Boasberg entered a judgment in favor of Meta in November 2025, concluding that the FTC failed to meet its burden to establish that Meta was a monopolist in the relevant market.³

The FTC’s case represented a continuation of aggressive—and bipartisan⁴—U.S. antitrust enforcement that some have described as attempting to diminish the role of quantitative economic analysis in favor of more qualitative and subjective analyses.⁵ The Complaint preceded the 2023 Merger Guidelines but shared a similar approach to market definition, emphasizing qualitative factors in assessing market definition, based on the Supreme Court’s 1962 *Brown Shoe* framework that assesses “reasonable interchangeability” of products when defining markets.⁶ The FTC argued that a qualitative *Brown Shoe*-type framework was relevant in the Meta case due in part to the fact that users face a zero price for Facebook, Instagram, and other on-line services, which raised challenges for a traditional Hypothetical Monopolist Test (“HMT”). The FTC’s *Brown Shoe*-type analysis focused on the view that the defining characteristics of PSNS were their provision of one-to-many communications with friends and family, and the use of a social graph to connect potential users.

Meta’s testifying experts, Professors Dennis Carlton and John List, introduced a variety of novel empirical studies, all of which indicated that the FTC’s market definition was too narrow.⁷ Judge Boasberg’s decision focused on a novel field experiment that evaluated how Facebook and Instagram users diverted time to other apps and activities in response to financial incentives to reduce engagement on those platforms. However, each of the analyses undertaken by Meta’s experts indicated that TikTok and YouTube were at least as close substitutes for Meta apps (Facebook and Instagram) as Snapchat, which is in the FTC’s proposed market, while other studies were also consistent with TikTok and YouTube being important substitutes. The Court recognized that Meta experts’ studies “all tell a consistent story,” while putting special emphasis on the pricing experiment sponsored by Prof. List. This was the first large scale field experiment used in antitrust litigation, as far as we know. Meta’s experts also presented evidence that showed the absence of consumer harms and the presence of consumer benefits from the Instagram and WhatsApp acquisitions.

2 Substitute Amended Complaint, *Federal Trade Commission v. Facebook, Inc.*, 1:20-cv-03590, (D.D.C.), September 7, 2021 (“Complaint”). The court had previously dismissed the FTC’s first Complaint filed in late 2020.

3 Memorandum Opinion, *Federal Trade Commission v. Meta Platforms, Inc.*, 1:20-cv-03590, (D.D.C.), November 18, 2025 (“Opinion”).

4 The FTC investigated and filed the case under the first Trump administration, continued it during the Biden administration, and then tried the case during the second Trump administration.

5 The demotion of economic tools has been one interpretation of the 2023 Merger Guidelines. See, e.g., Gregory J. Werden, “Comments on Draft Merger Guidelines,” <https://ssrn.com/abstract=4540166>; and Dennis W. Carlton (2024), “The 2023 Merger Guidelines: A Critical Assessment,” *Review of Industrial Organization* 65(1).

6 For a variety of views on the Merger Guidelines, see the 2024 special issue “The U.S. 2023 Merger Guidelines,” *Review of Industrial Organization* 65(1).

7 Professors Carlton and List provided testimony in the trial on a variety of sometimes overlapping topics. Prof. List conducted the Pricing Experiment discussed below and the merger simulation, as well as other studies of market definition. Prof. Carlton was responsible for studies of market definition, price discrimination, industry trends, and competitive effects.

After briefly providing background on the industry and the FTC's analysis supporting its claims, we summarize the empirical analyses presented by Professors Carlton and List, highlighting how modern theoretical and quantitative tools of economic analysis were used to address market definition and competition issues. Ultimately, the empirical analysis helped to convince Judge Boasberg to rule in Meta's favor, representing a win for the use of economic theory combined with modern, quantitative analysis over the sole use of subjective, qualitative analysis in antitrust.

A key lesson of the FTC's case against Meta is that both courts and antitrust regulators should be skeptical of attempts to define markets based solely on subjective, qualitative factors when it is possible to engage in empirical analysis. The Meta case establishes that modern empirical and theoretical tools can be used to evaluate market definition even in multi-sided industries where users face a pecuniary price of zero.

II. INDUSTRY BACKGROUND

In 2012, Facebook was a popular app that primarily functioned to allow users to communicate with their friends by posting and sharing news. Other apps such as MySpace and Friendster pre-dated Facebook and provided similar features, but by 2012 Facebook overtook these other established apps to become the leading social app because Facebook offered superior features and reliability.

Instagram was founded in 2010, around the same time that mobile smartphones began growing in popularity. Smartphones equipped with cameras easily enabled the taking and posting of photos online. Instagram was still a small firm in 2012 but it offered a photo sharing app with a variety of popular photo-related features. Unlike Facebook, Instagram was not used primarily to communicate with friends but rather to post pictures for anyone to see. Indeed, as the U.K.'s competition authority, the Office of Fair Trading ("OFT") explained at the time it approved Facebook's acquisition of Instagram, the uses of Facebook and Instagram were different and there were several camera apps that were closer competitors to Instagram than Facebook.⁸

Meta purchased Instagram for \$1 billion in 2012, and no U.S. or international (*e.g.*, UK and EU) government enforcement actions were taken. Following its acquisition of Instagram, Meta invested heavily to develop supporting infrastructure and features for its apps and implemented an improved monetization strategy. Instagram grew from a few million users at the time of acquisition in 2012 to over a billion worldwide by 2018, and around three billion by 2025.⁹ The FTC's economic expert witness did not dispute that Meta invested heavily in Instagram, nor that Meta's investment in Instagram has proven to be highly successful, or that such returns are rare in the context of venture capital investments in technology industries.

WhatsApp allows users to communicate securely with other WhatsApp users via text messages, telephonically, or by video over the internet. Meta purchased WhatsApp, and its user base, for \$19 billion in 2014. As in the case of the Instagram acquisition, the U.S. and international government competition authorities examined the merger and allowed it to proceed. WhatsApp—which historically has been more successful outside the U.S.—grew from around 450 million in 2014 to two billion by 2020 and three billion by 2025.¹⁰ Because neither the FTC nor Judge Boasberg focused on WhatsApp¹¹ (which was claimed only to be a potential entrant at the time of its acquisition), we will largely ignore it in this article and focus on Meta's other apps.

The features and functionality available to users of Facebook and Instagram have changed substantially in the past 15 years. In addition, new platforms have emerged that compete with Meta apps for users' attention, perhaps the most important of which, TikTok and YouTube, rely heavily on video content. These apps curate the content that a viewer is shown and were instrumental in driving the enormous growth in user time spent on video content (especially short form). The functionality of the different apps has converged as Facebook, Instagram, and other apps sought to copy the innovative and popular features introduced by others including short-form video content. At the time of trial, it was possible to use all the major social apps to do many of the same things, including watching videos, sending messages to friends, and posting pictures.

8 Office of Fair Trading, "Anticipated acquisition by Facebook Inc of Instagram Inc," ME/5525/12, August 22, 2012, <https://assets.publishing.service.gov.uk/media/555de2e5ed-915d7ae200003b/facebook.pdf>, ("OFT Decision"), ¶ 16.

9 Statista, <https://www.statista.com/statistics/183585/instagram-number-of-global-users/?srsltid=AfmBOoqTUuCqUbYikx8JQRZgYCP9Kxe3kRqg3hpToUZDoxnLZCuMU1pX> and <https://www.statista.com/chart/9157/instagram-monthly-active-users/?srsltid=AfmBOoABTu28X0XmJLSjfpdHbcUkmF6x02ZCJTn1W2V6agFFRgtEwFi>.

10 Statista, <https://www.statista.com/statistics/260819/number-of-monthly-active-whatsapp-users/>; Ivan Mehta, "WhatsApp now has more than 3 billion users a month," *TechCrunch*, May 1, 2025, <https://techcrunch.com/2025/05/01/whatsapp-now-has-more-than-3-billion-users/>.

11 Judge Boasberg's decision largely excluded consideration of WhatsApp, stating, "Because the Court decides this case on that market's boundaries alone, WhatsApp is not relevant to what follows and will now disappear from the case." Opinion, pp. 6-7.

One consequence of the rise of video was a substantial decline in the share of time that Facebook and Instagram users spent communicating with friends and family. A conservative calculation presented by Prof. Carlton indicated that around the time of the trial, communicating with friends and family constituted just 17% of time spent on Facebook and 7% of time spent on Instagram. Two years prior, those figures had been 22% and 11%, respectively, for Facebook and Instagram. The use of Facebook to view video content, in contrast, expanded dramatically over time, exceeding 50% of user time on Facebook at the time of trial.

In order to understand how Meta makes money, one needs to understand that users and advertisers participate on different sides of the app platforms. Meta wishes to attract viewers (eyeballs) to its platform and does so by offering attractive features that users want. Meta monetizes this attention primarily by showing ads to users and charging the advertisers. The ad load that users face is one of many quality attributes of the product, and it is the one that the FTC focused on. But the FTC and its expert largely did not account for the multi-sided nature of the industry, thus leading to erroneous conclusions about the effect of allegedly reduced competition on ad load and consumer welfare.

III. THE FTC'S ECONOMIC CASE

The FTC argued that the lack of any price charged to users meant that markets could not be defined using evidence of consumer substitution in response to price changes. Instead, the claim by the FTC and its economic expert that PSNS was a relevant economic market was based on *Brown Shoe*-type criteria, which attempt to determine the set of products that have “reasonable interchangeability” with Meta apps. In that sense, the FTC’s approach was consistent with the thrust of the 2023 Merger Guidelines in its reliance on legal precedents, especially *Brown Shoe*, over direct economic evidence. The FTC’s expert claimed his analysis was consistent with the Hypothetical Monopolist Test in the 2023 Guidelines, but he presented no empirical evidence to implement the HMT.

Consistent with reliance on *Brown Shoe*, the FTC explained that the market should be defined by examining how consumers used Facebook and identifying other products that could provide the same use. The “use case” the FTC focused on was “one-to-many” communications between a user and “friends and family.”¹² In furthering this use, the FTC also focused on apps’ use of a “social graph” to identify other users in a user’s extended circle of friends and family. The FTC’s PSNS market definition was supported not by empirical analysis but by references to Meta documents and quotes from Meta executives. The FTC’s *Brown Shoe*-type analysis, however, failed to recognize dramatic changes in how Meta apps are used that can affect substitution patterns, including the rapid growth of video and the declining use of Meta apps for communicating with friends and family.

The FTC claimed that only Facebook, Instagram, and Snapchat were important providers¹³ of the friends and family use case and calculated that Meta’s share of user engagement in the PSNS market exceeded 60%, a common benchmark in legal cases for establishing monopoly power. As a result of this share, the FTC’s expert claimed that Meta had monopoly power and imposed a higher ad load on users than they would face in the but-for world where Meta did not own Instagram or WhatsApp, which he deemed to have been a competitor and a potential entrant, respectively, prior to their acquisition by Meta. If apps like TikTok and YouTube that focus on video,¹⁴ are included, then Meta’s share of engagement in the relevant market was below the 60% threshold.¹⁵

Although the FTC’s application of the *Brown Shoe* framework yields a hypothesis about the scope of the relevant market, this approach can support alternative market definition hypotheses—one is PSNS; another might include video as a critical use case defining the relevant market; another might be the use of the Internet for leisure. However, the FTC and its expert did not empirically evaluate alternative hypotheses. Empirical evidence is important for distinguishing these possibilities.

Moreover, the FTC’s market definition did not address the multi-sided nature of Meta platforms. Instead, the FTC’s market definition analysis focused exclusively on the user side of the market and ignored interactions between the user and advertiser sides of the platform. Meta

12 Paradoxically, the FTC simultaneously claimed that all “uses” of Facebook and Instagram, including watching video, were in the market, even those uses not involving friends and family. In part for this reason, Professors Carlton and List explained that the FTC’s theory of the factors that defined the market was inconsistent.

13 The FTC also included MeWe in its market, but MeWe has far fewer users than others apps in the FTC’s proposed market (many industry witnesses said they were unfamiliar with it) and received little attention at trial. We do not address it further in this article.

14 As Judge Boasberg recognized, TikTok is devoted to short-form video while YouTube features both long-form video and short-form video (*e.g.*, YouTube Shorts, which “are virtually identical to a TikTok video or a Facebook or Instagram Reel”). Opinion, pp. 7-8.

15 Judge Boasberg characterized Meta’s share of a market that included both TikTok and YouTube as “modest.” Judge Boasberg cited a series of opinions that found monopoly power may be inferred if share was above a threshold of between 70% and 80%, and indicated the 60% share used in *Alcoa* was the “canonical statement on the relationship between market shares and monopoly.” Opinion, pp. 85-86.

offers services to users at a pecuniary price of zero and then monetizes that attention through the sale of advertising. The FTC focused on ad load as the “attention price” that users paid for using Meta apps and argued that the merger of Facebook and Instagram harmed users by raising ad load. However, the FTC ignored the effect of an increase in ad load on the advertiser side of the platform and did not address how increases in ad load affect the price (and effectiveness) of ads, which is a key factor that drives Meta’s decisions about ad load levels.

The FTC’s failure to account for the multi-sided nature of the market in attempting to evaluate the impact of the Facebook/Instagram merger was a critical oversight. While mergers in one-sided markets can, all else equal, create upward pricing pressure, it is widely recognized that a merger between multi-sided platforms does not necessarily create upward pricing pressure on all sides of a multi-sided platform and may even lead to lower prices on one side of the platform.¹⁶ The theoretical impact of a merger on price on any given side of a platform is ambiguous and depends on diversion patterns between the merging firms on both sides of the platform. Here, the impact of a merger on ad load depends on diversion between Facebook and Instagram on both the user and advertiser side of the platform.¹⁷ Thus, the FTC’s fundamental assumption that Meta’s acquisition of Instagram necessarily creates pressure to raise ad load is not supported as a matter of economic theory. Empirical evidence is needed, and although the FTC highlighted a general upward trend in Meta ad loads over time, neither the FTC nor its expert presented an analysis establishing that the trend could be attributed to the merger.

IV. META’S MARKET DEFINITION EVIDENCE

Professors Carlton and List undertook a variety of empirical analyses to test the FTC’s proposed market definition. Prof. List undertook a field experiment that evaluated how Facebook and Instagram users diverted their time to other activities in response to financial incentives to reduce engagement on Meta apps. The field experiment also evaluated whether users cut back on friends and family elements of Meta services less than other service elements, as would be expected based on the FTC’s *Brown Shoe*-type analysis. Prof. Carlton analyzed a natural experiment that evaluated diversion to other apps resulting from an 8-hour outage of Meta services in October, 2021. These analyses fit experimental frameworks with well-defined “treatment” and “control” groups and thus can be interpreted as establishing causal relationships.

The Pricing Experiment and Meta outage analyses yield estimates of diversion between Meta apps and other apps as well as off-phone time. Such estimates are central to various approaches to evaluating market definition and merger impacts, including the hypothetical monopolist test, and merger simulation. They are used here to evaluate the FTC’s market definition and to directly evaluate the FTC’s view that separation of Facebook and Instagram would benefit consumers by reducing the ad load faced by users.

Professors Carlton and List also sponsored other empirical analyses focused on consumer substitution among apps that the Court considered to be informative about user substitution patterns, including natural experiments that enabled analysis of diversion patterns resulting from the imposition of a ban on TikTok in India in 2020, a TikTok shutdown in the U.S. in 2025, a YouTube outage in 2018, as well as an observational analysis of how Meta users switched their use of apps over time. Indirect evidence of competition on features and for content beyond the boundaries of the FTC’s market also pointed to a broader market. Finally, empirical evidence was presented contradicting the FTC’s claim that Meta was price discriminating based on a user’s reliance on friends and family interactions. We summarize those studies below.

Even if the FTC’s view that a relevant market could be defined around friends and family use was defensible at first glance based on *Brown Shoe* factors, any proposed market definition should be confronted with available data to establish its reliability. Failure to consider available data opens the door to arbitrary policy enforcement. The studies described in this section, taken together, pointed to the conclusion that the FTC’s PSNS market definition consisting of Facebook, Instagram, and Snapchat was not supported by the data. The evidence establishes that TikTok and YouTube are closer substitutes for Meta than is Snapchat, which was in the market posited by the FTC. The court concluded that “[w]hile each of Meta’s empirical showings can be quibbled with, they all tell a consistent story: people treat TikTok and YouTube as substitutes for Facebook and Instagram, and the amount of competitive overlap is economically important.”¹⁸

A. Pricing Experiment

The Pricing Experiment included more than 6,000 participants that agreed to install device monitors on their smartphones and have their on-device activity tracked for up to eight weeks. The participants mirrored key observable characteristics of Facebook and Instagram users, including

¹⁶ See, e.g., Jean-Charles Rochet and Jean Tirole (2006), “Two-sided markets: a progress report,” *The RAND Journal of Economics*, 37(3):645–667.

¹⁷ This is often referred to as the “seesaw principle.” *Id.*

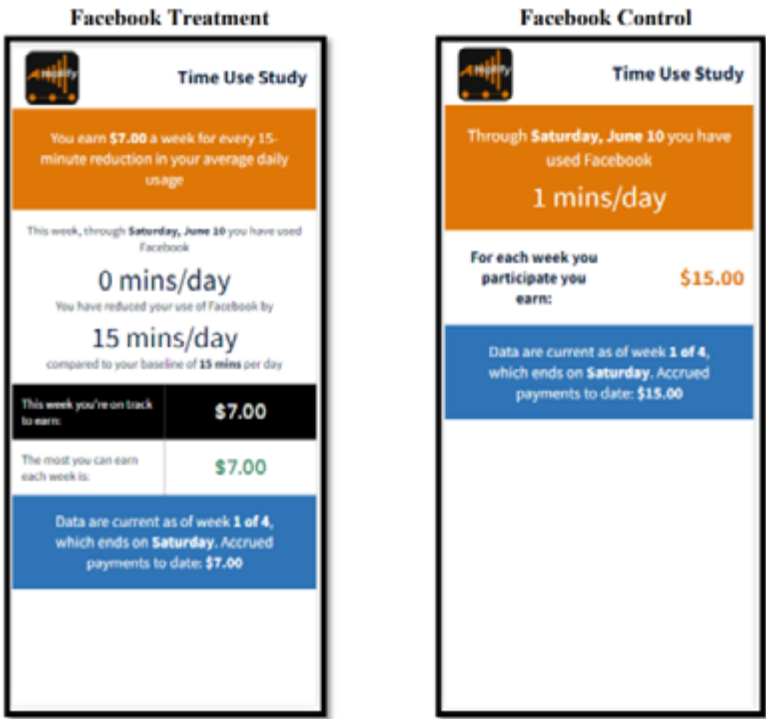
¹⁸ Opinion, p. 56.

their age, gender, historical patterns of use of both Facebook and Instagram, and the size of their networks of friends and family. Participants were randomly assigned to treatment and control groups in a manner that ensured comparability across observable factors.

Two separate field experiments (one for Facebook and one for Instagram) were run to evaluate diversion resulting from financial incentives to reduce engagement on the focal app. Members of the treatment group were paid \$4 for each hour that they reduced engagement of the focal app relative to the participant's engagement prior to the experiment. Members of the control group were paid \$15-\$25 per week to remain in the experiment.

A device monitor was installed on a participant's device to track the usage of all apps by members of both the treatment and control groups for four weeks. Each participant was given access to a dashboard that provided daily updates about the extent of his or her engagement on the focal app and accrued compensation. In the Facebook experiment, for example, participants in the treatment group were shown the screen on the left in Figure 1; participants in the control group were shown the screen on the right.

Figure 1: Participant Dashboards used in Facebook Pricing Experiment¹⁹



The design of the Pricing Experiment was informed by a series of pilot studies. An initial pilot evaluated the reliability of the device monitor by comparing user-specific measures of engagement on the focal app obtained from the device monitor with (i) measures of engagement obtained directly from Meta; and (ii) on-device usage logs maintained by device operating systems. That pilot study established that the device monitor was highly reliable on Android devices but not on iOS devices. As a result, the experiment was limited to participants with Android devices.²⁰

A second pilot evaluated alternative payment levels to ensure that the financial incentives provided to participants were large enough to ensure reductions in engagement that yielded reliable estimates of diversion. A third pilot was a three-week test of the full experiment that evaluated whether the duration of the experiment was long enough to generate stable diversion effects and to evaluate attrition patterns. Based on these pilot studies, it was determined that the Pricing Experiment would utilize a \$4 per hour incentive to reduce engagement on the focal app and that a four-week treatment period would be sufficient to generate stable diversion patterns.

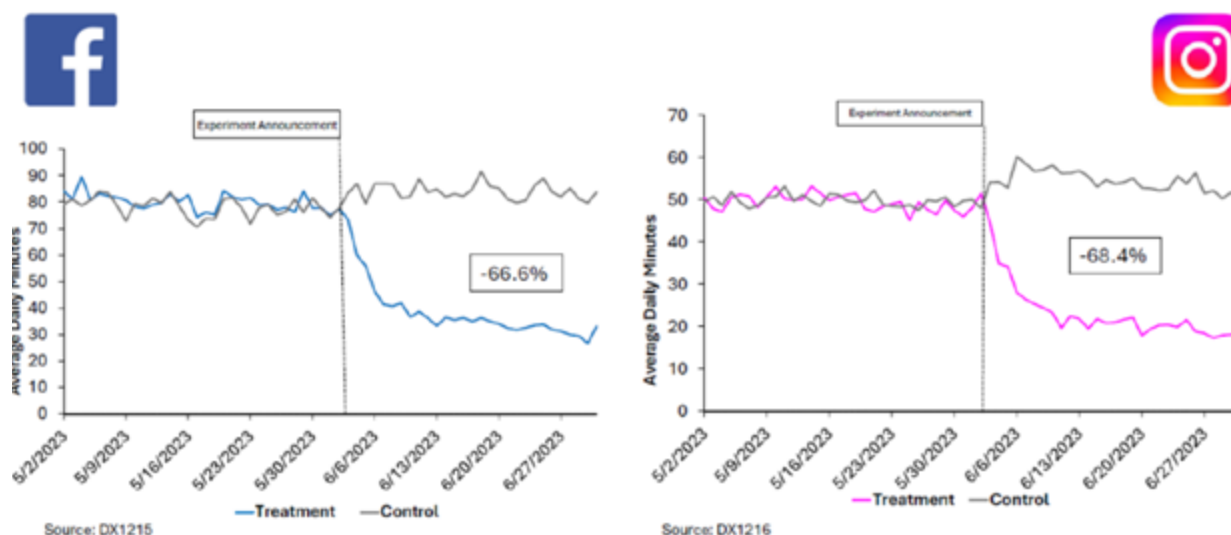
The impact of financial incentives on engagement on Meta apps is summarized in Figure 2, which reports average engagement for the treatment and control groups in the four weeks before and the four weeks after the launch of the experiment. Prior to the launch, average

¹⁹ Joseph Goodman, Lancelot Henry de Frahan, Justin E. Holz, John A. List, Niall MacMenamin, Evan C. McKay, Magne Mogstad, Sally Sadoff, and Hal Sider, "Consumer Demand and Market Competition with Time-Intensive Goods," revised May 2026, NBER Working Paper 34743, <https://www.nber.org/papers/w34743>, Figure C.3.

²⁰ The generalizability of an Android-only study was established by comparing the results of a series of past internal Meta experiments across Android and iOS users. These analyses established that treatment effects for Android and iOS users were very similar.

engagement in the treatment and control groups was nearly identical. Engagement on the focal apps started to fall almost immediately with the launch of the experiment and stabilized at a roughly two-thirds reduction after about one week.

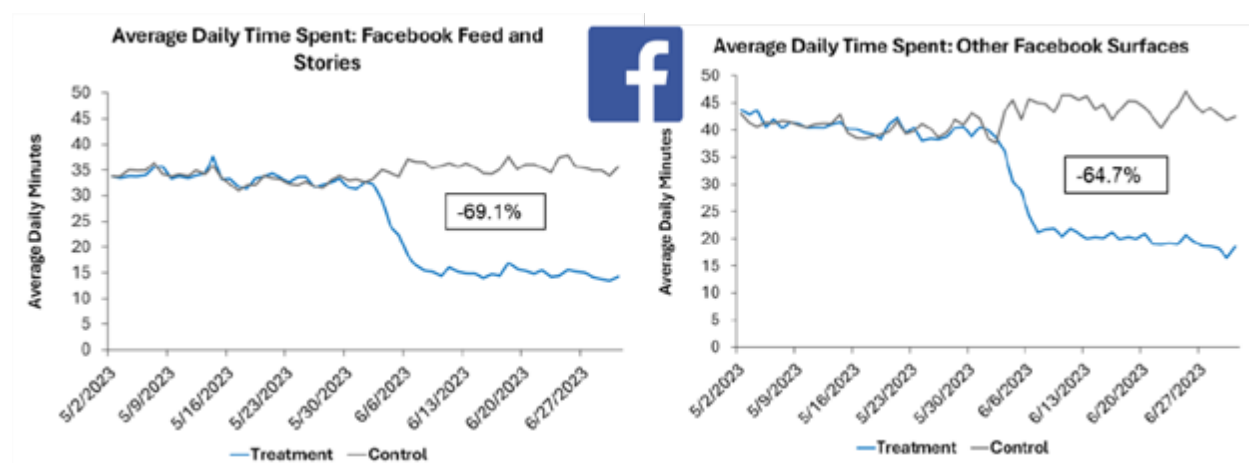
Figure 2: Impact of Financial Incentives on Engagement on Facebook and Instagram



This “first-stage” analysis yields a direct test of the FTC’s view that engagement in Meta apps is driven by the desire to connect with friends and family, as implied by the FTC’s *Brown Shoe* analysis. Meta’s data identify the time that users spend on each “surface” of its apps (an area of the app where content is displayed, *e.g.*, feed, stories, photos, marketplace, *etc.*) The FTC acknowledged that the “Feed” and “Stories” surfaces on both Facebook and Instagram were central to users’ ability to connect with friends and family. If the FTC’s hypothesis is correct that the ability to connect with friends and family is the defining feature of PSNS, it would be expected that engagement on the Feed and Stories surfaces would fall less than on other surfaces in response to financial incentives.

But that’s not what the experiment found. In Figure 3, the left panel reports the time spent on Feed/Stories surfaces for Facebook, and the right panel reports time spent on all other Facebook surfaces. The results show that the decline in engagement on Feed/Stories and on other surfaces were comparable. Results from the Instagram experiment (not shown here) indicated similar declines in engagement on Feed/Stories and on other Instagram surfaces in response to economic incentives.

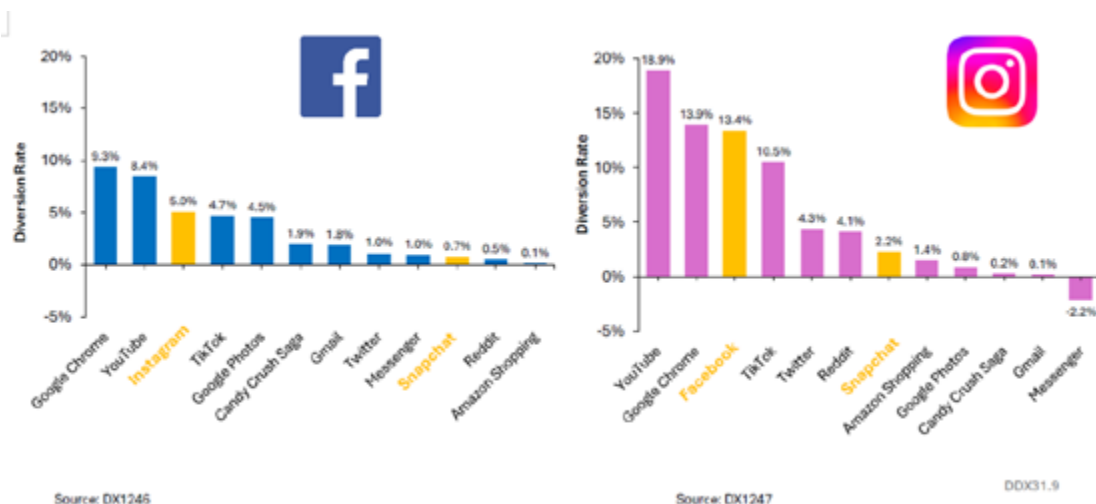
Figure 3: Impact of Financial Incentives on Engagement on Facebook Feed/Stories and Other Facebook Surfaces



Patterns of substitution in response to changes in relative prices are central to market definition and the primary goal of the Pricing Experiment was estimation of diversion from Meta apps to other apps and activities in response to financial incentives. Diversion rates reflect the share of users’ time that moved away from Facebook or Instagram that is captured by each other app and off-device activity.

Diversion to other apps is summarized in Figure 4 for both the Facebook and Instagram experiments. The apps that the FTC includes in its PSNS market definition are in yellow. In both the Facebook and Instagram experiments, diversion to YouTube and TikTok (and other apps) exceeds diversion to Snapchat, which indicates that these apps are more important competitive constraints on competition for the attention of Meta users than Snapchat. This result is inconsistent with the FTC’s market definition that includes Snapchat but excludes TikTok and YouTube. Users shifted roughly 39% of their time diverted from Facebook and 29% of their time diverted from Instagram to off-device activities.

Figure 4: Patterns of Diversion from Meta Apps in Response to Financial Incentives



Although unadjusted diversion rates are key inputs into a hypothetical monopolist test, it is possible that a different set of rivals that includes apps with lower diversion rates and excludes apps with higher diversion rates may pass a HMT.²¹ That raises the question about how to identify the smallest set of firms to consider in any such exercise. While the FTC did not present such an analysis, the FTC’s expert suggested that a natural way to rank rivals in any such analysis is based on Indexed Diversion. Such a measure expresses a diversion rate—the share of diversion attracted by a rival app or off-device activities—relative to its share of time in the baseline period. An Indexed Diversion Ratio greater than one indicates that diversion to an app is greater than proportional to its baseline on-device time.

As shown in Figure 5, the results of the Pricing Experiment indicated Indexed Diversion to TikTok and YouTube exceeded that to Snapchat in both the Facebook and Instagram experiments. That is, even if one were to rank apps based on Indexed Diversion for potential inclusion in a HMT, as the FTC’s expert suggested, both TikTok and YouTube are still more natural candidates to consider than Snapchat. This further establishes that there is no empirical basis for identifying a market that includes Snapchat but does not include TikTok and YouTube. As shown at trial, diversion to off-device activities (39% in the Facebook experiment and 29% in the Instagram experiment) was less than proportional to the share of time spent off-device in the baseline period (72% in the Facebook experiment and 71% in the Instagram experiment).

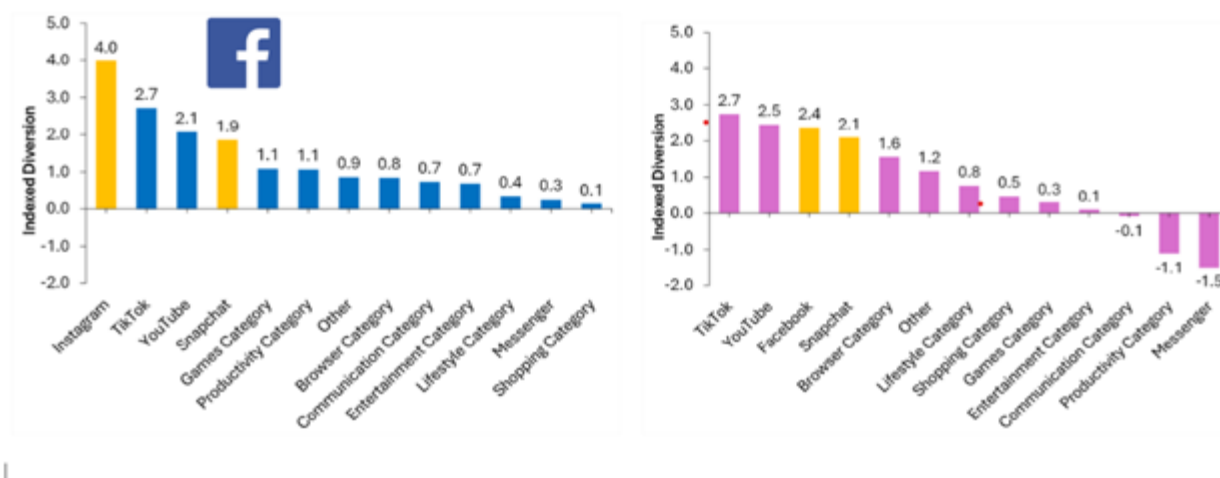
The Court highlighted that the Pricing Experiment “offers the single best evidence of what consumers consider alternatives to Meta apps ...”²² The Court found that the Indexed Diversion patterns from the Pricing Experiment were “even more striking” for the purpose of contradicting the FTC’s market definition.²³

²¹ This is a well-known issue with the HMT. It is possible for products A, B, and C and products A, B, and D to each pass the HMT. That is why Merger Guidelines prior to 2023 all indicate a preference to include products in order of substitution so that if product C was a better substitute to A and B than product D, one prefers the A B C market definition. (For further discussion, see the 1997 and 2010 Merger Guidelines; Gregory J. Werden, “Market Delineation Algorithms Based on the Hypothetical Monopolist Paradigm,” No. 8. Economic Analysis Group, Antitrust Division, US Department of Justice, 2002; and Dennis W. Carlton (2007), “Market Definition: Use and Abuse,” *Competition Policy International*, 3(1): 3-27.) The possibility that the HMT does not uniquely define a market highlights the crude nature of using market definition and shares based on it to make predictions. When applicable and feasible, a merger simulation bypasses these issues. We discuss such a simulation below.

²² Opinion, p. 46.

²³ Opinion, p. 46.

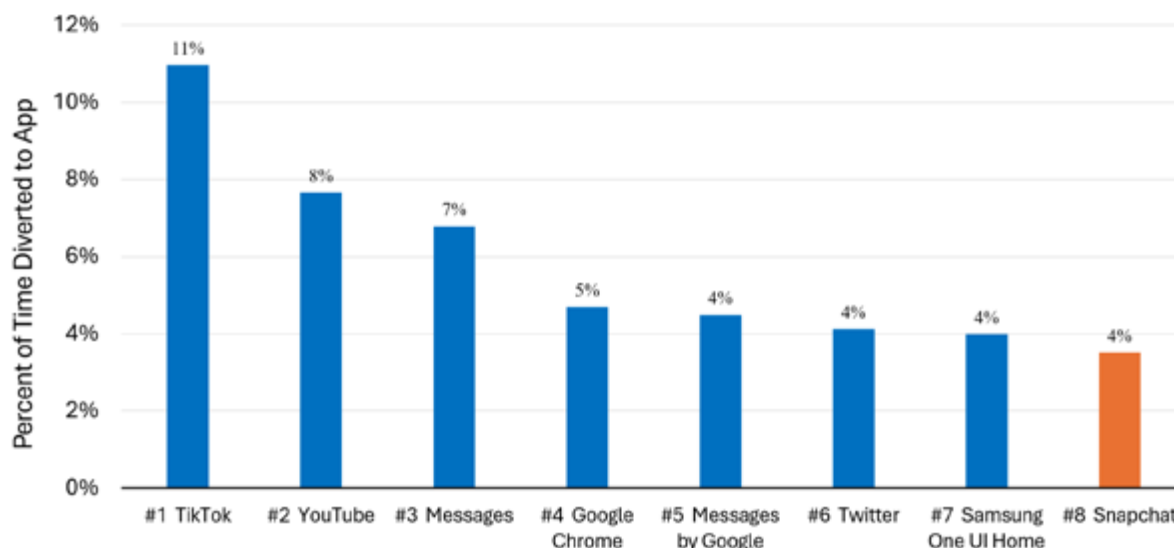
Figure 5: Indexed Diversion Patterns from Pricing Experiment



B. Meta Outage (2021)

The Meta global outage in 2021 provided a natural experiment that enables one to assess whether the FTC had omitted from its proposed PSNS market substitutes to Facebook and Instagram that were more important than Snapchat. Meta's apps experienced an outage for about 8 hours on Monday, October 4, 2021. An analysis of data on how users of Meta apps shifted their time away from Facebook and Instagram and towards other apps during this outage provides evidence on the apps that users viewed as substitutes for Meta's apps.²⁴ Compared to the prior three Mondays, users shifted about 75% of their time from Meta to other apps, and the apps that received the largest increase in time spent by users were TikTok, YouTube, Twitter, and Snapchat. TikTok and YouTube each received more than twice the number of increased minutes that Snapchat did.²⁵ See Figure 6.

Figure 6: Impact of Meta Outage on Meta Users' Engagement with Other Apps During the Outage



The FTC pointed out that an outage is not the same as a 5% increase in price usually considered under the HMT and so questioned the relevance of this substitution data. Although it is true that an outage is not equivalent to a small price increase, there is no reason to think that the relative patterns of substitution showing that more time was diverted to TikTok and the other apps than to Snapchat would change in response to a different price increase.

²⁴ This analysis used the Meta Study data, which contains information from study participants whose app usage is tracked by a device monitor. The Meta Study data are based on users of Android devices.

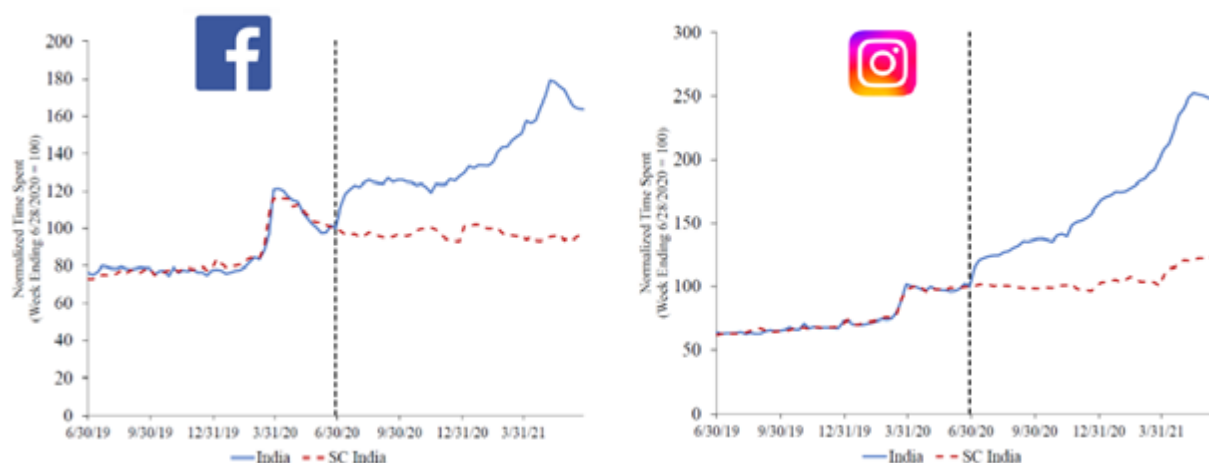
²⁵ Econometric analysis confirmed this ranking. See Appendix 1 of Dennis W. Carlton, John A. List, Allan Shampine, Hal Sider, and Theresa Sullivan (2026), "FTC v. Meta: The Importance of Quantitative Evidence in Antitrust," https://papers.ssrn.com/abstract_id=7134958.

C. Additional Quantitative Analysis

Meta's experts presented other analyses that provide further evidence that consumers view TikTok and YouTube as important substitutes for Facebook and Instagram. One analysis evaluated the impact of India's ban of TikTok in June 2020. This natural experiment was evaluated using a synthetic control analysis, which establishes a "but for" estimate of engagement in India in the absence of the ban based on the combination of engagement patterns in other countries that most closely approximates engagement patterns in India prior to the ban.

The results, summarized in Figure 7 below, indicate that engagement on Facebook and Instagram in the countries that comprise "synthetic India" closely mirror engagement in India prior to the ban, but engagement in India increased rapidly following the ban's imposition. The divergence of actual engagement from what would be expected but for the ban is statistically significant, leading to the conclusion that the TikTok ban led to an immediate and significant positive effect on Facebook and Instagram engagement. The observed substitution from TikTok to the Meta apps indicates that there is a large group of users who view Facebook and Instagram as substitutes for TikTok

Figure 7: Facebook and Instagram Engagement in India, compared to a Synthetic Control Group, Before and After the TikTok Ban



Two other natural experiments provided additional evidence of substitution between TikTok, YouTube, and other apps: a TikTok shutdown in the U.S. in 2025 and a YouTube outage in 2018. Each of these events resulted in substitution patterns consistent with the idea that a large group of users view Meta apps as substitutes for TikTok and YouTube.

Finally, an empirical analysis of device monitor data evaluated how 48,000 participants reallocated time to other apps following changes in their use of Meta apps. This analysis did not evaluate responses to specific events, but also established that switching from Meta apps to TikTok and YouTube was greater than switching to Snapchat. All of these analysis were cited favorably by Judge Boasberg.

D. Other Evidence of Competition: Copying Features and Competing for Content Creators

Qualitative evidence not presented by the FTC also pointed to competition between the Meta apps and TikTok and YouTube, indicating the market was broader than that claimed by the FTC. Although the evidence described here is not direct empirical analysis of substitution, it demonstrates that the FTC's *Brown Shoe* analysis focused on an incomplete set of characteristics.

Among these pieces of qualitative evidence was the widespread copying of features and shift towards video as the dominant use of these apps. Meta recognized the growing importance of short-form video on YouTube and TikTok and added related features to Facebook and Instagram. Facebook, Instagram, TikTok, YouTube, and Snapchat all copied each other's features that proved to be popular with users. For example, TikTok launched in the U.S. in 2018, and Facebook and Instagram (Reels), YouTube (Shorts), and Snapchat (Spotlight) all soon began offering short-form video. In addition, Meta and YouTube revamped how they choose content that a user sees by copying the TikTok model of using AI. On all these social media apps, video is now the predominant use. In terms of networking with friends and family, that can now be done on any of the social media apps.²⁶

²⁶ Judge Boasberg pointed to TikTok's social features that allow users to "like videos, comment on them, repost them, search for specific accounts, follow accounts, exchange messages, and share videos with others." Opinion, p. 7. He also noted that TikTok uses a social graph, though it has not been highly successful. Opinion, pp. 64-65.

Another piece of qualitative evidence of competition was that the social media platforms all try to recruit many of the same influencers and content creators for their platforms.²⁷ Since they are competing to attract the same marginal viewers, it is no surprise that they choose to bid against each other to be able to offer similar content.²⁸

The Court agreed that this qualitative evidence pointed to a broader market, finding that “[w]hen apps inside and outside the FTC’s alleged market are deliberately offering the same features and competing to get the same people to post the same videos, that is strong evidence that that they are competing for the same users who are after the same things.”²⁹

E. Lack of Price Discrimination Tied to Alleged Market

The FTC defined a relevant market based on one particular use (friends and family) and dismissed the importance of competition from rivals for other uses. The claim was that users’ dependence on the friends and family use of Meta’s apps—and the lack of substitutes for that use—gave Meta market power in a narrowly defined market that excluded rivals who offered other uses. This could be a sensible market definition only if (among other things) Meta was price discriminating by charging a different “attention price,” or ad load, for Meta’s friends and family content relative to other content. Empirical analysis, however, demonstrated that Meta did not price discriminate by type of content in this way.

If the lack of substitutes for friends and family content is the source of Meta’s market power, then one would expect that ad loads would be higher for friends and family related content than for content unrelated to friends and family. However, empirical analysis showed that ad loads are not systematically higher for users that consume more friends and family content or for surfaces on Meta apps that have more friends and family content. A regression of ad load on the number of friends a Facebook user had (which the FTC’s expert used as a proxy for the importance of friends and family use to a user) showed a statistically significant *negative* correlation between ad load and the number of friends. That is, ad loads were *lower* for users whom the FTC claimed were more dependent on friends and family sharing.³⁰ This is the opposite of what the FTC’s theory of market power implies: the data contradicted the claim that Meta was price discriminating against friends and family users.

In his decision, Judge Boasberg also pointed to an analysis of ad load and friends and family use on different Facebook surfaces that contradicts the FTC’s claim that Meta price discriminates against friends and family use.³¹ Figure 8 below shows that the Facebook Surface with the highest share of time spend on friends and family use, Facebook Stories, has the lowest ad load and there is no correlation between friends and family use and ad loads across the Facebook surfaces. Finally, as noted above, the Pricing Experiment showed that when users were paid to leave Facebook or Instagram, they did not reduce time on friends and family surfaces disproportionately less than on other surfaces—which is what the FTC theory predicted.

²⁷ See Opinion, p. 66.

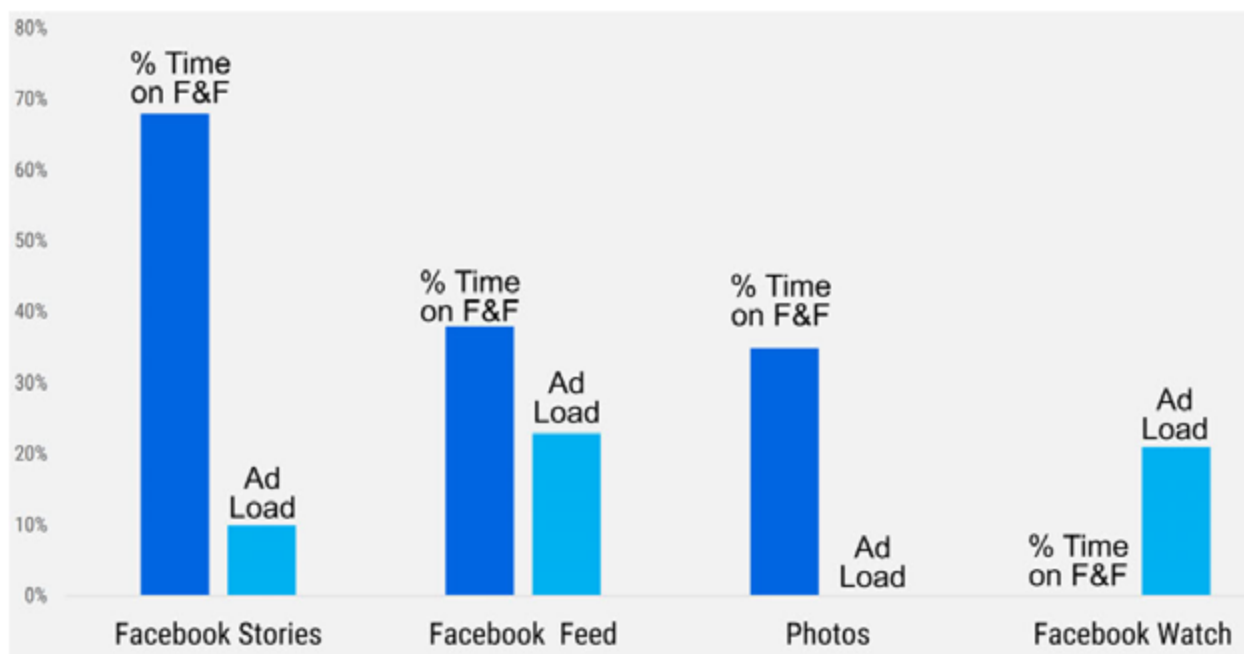
²⁸ See, e.g., Cristina Criddle, “Instagram Cuts Influencer Payments for Short Videos,” *Financial Times*, April 5, 2022, <https://www.ft.com/content/df2d753d-4346-49d8-88d7-441156dc8dc3>; Abram Brown, “Facebook Will Pay Creators to Put Their Knockoff TikTok Videos in Its Main News Feed,” *Forbes*, September 29, 2021, <https://www.forbes.com/sites/abrambrown/2021/09/29/facebook-reels-instagramcreators-influencers-tiktok/?sh=3595ff907cef>; Influencer Marketing Hub, “The State of Influencer Marketing: 2023,” https://influencermarketinghub.com/ebooks/Influencer_Marketing_Benchmark_Report_2023.pdf, p. 37.

²⁹ Opinion, p. 66.

³⁰ A regression analysis examining the relationship between an Instagram user’s ad load and the number of followers (or the number of accounts followed) also yielded a statistically significant negative correlation. See Appendix 1 of Carlton, *et al.* (2026), *supra* note 25.

³¹ Opinion, p. 79.

Figure 8: Friends and Family Activity and Ad Load, by Facebook Surface³²



F. Analyzing the FTC's Claims About Ad load Using Merger Simulation

The FTC claimed that Facebook's acquisition of Instagram harmed consumers by imposing a higher ad load on users than would have occurred had the two firms never merged, and the FTC sought the divestiture of Instagram by Meta. The FTC's claim that more competitors implies a lower price (or ad load, here) is based on the standard economic logic of one-sided industries.³³ As discussed above, more competitors implies lower prices in one-sided industries (all else equal). But that logic does not necessarily apply in multi-sided industries. In multi-sided industries, an increase in the number of competitors does not necessarily result in lower prices on each side of the platform.

The extent to which an increase in competition affects price (or ad load, here) in these settings depends on the relative patterns of diversion, the elasticity of demand, and margins on both the user and advertiser sides of the platform, as well as the indirect network effects between different sides of the platform. Thus, the impact of a "de-merger" of Facebook and Instagram on ad load is an empirical question that cannot be determined based on theory alone. In simple terms, a merger between Facebook and Instagram may create incentives to raise ad load (which implies lower ad prices), or to reduce ad load (which implies higher ad prices). Theory alone cannot answer this question; empirical analysis is needed.

To directly address the FTC's claim that the separation of Facebook and Instagram would result in a lower ad load, a "de-merger" simulation analysis was used to model the competition that would be created if Facebook and Instagram competed with each other, taking into account the multi-sided nature of the Meta platform. This "de-merger" analysis is a "reverse" application of merger simulation frameworks. A merger simulation framework accounts for diversion between merger partners in evaluating whether the combined firm will raise prices; a de-merger analysis accounts for diversion between commonly owned services in evaluating whether separation of the firms would be expected to lower price.

As such, the "de-merger" simulation directly evaluates the FTC's claim that the separation of Facebook and Instagram would be expected to lower ad load. The model utilizes data on, among other things, user-side diversion rates between Facebook and Instagram from the Pricing Experiment, data on margins earned by Meta; estimates of the impact of changes in ad load on user engagement from internal Meta experiments; and data on changes in the effectiveness of advertising resulting from changes in ad load based on the results of internal Meta experiments.³⁴ The analysis evaluates the de-merger impact on ads under alternative assumptions about ad-side diversion between Facebook and Instagram.

³² Opinion, p. 79.

³³ Even in a one-sided model, it is well known that more competition leads typically to lower prices but may or may not lead to higher quality. See, e.g., Dennis W. Carlton and Jeffrey M. Perloff (2005), *Modern Industrial Organization*, 4th ed., (Boston: Pearson/Addison Wesley), Ch. 15.

³⁴ See Appendix 2 of Carlton, *et al.* (2026), *supra* note 25. For more detail, see Goodman, *et al.* (2026), *supra* note 19.

The results indicated that a “de-merger” of Facebook and Instagram would result in a small *increase* in ad load (on the order of 2-3%) so users would, under the FTC’s framework, be made worse off as the result of a de-merger. The results of the de-merger analysis thus directly contradict the FTC’s claim that splitting up Facebook and Instagram would benefit consumers by decreasing ad load.

V. THE FTC’S RESPONSE AND META’S REPLY

A. Debate on Empirical Evidence

The FTC and its expert argued that all of the quantitative evidence presented by Professors Carlton and List was flawed and could not reliably approximate the SSNIP framework. For example they argued that an outage or ban is not of the same magnitude as a 5% price increase assumed in the typical SSNIP framework, and that the incentive offered in the Pricing Experiment also was larger than that threshold. They also argued that the duration of the diversion patterns observed in the Pricing Experiment and outage analyses were too short to approximate a SSNIP.

Although each analysis may have been imperfect, that is typically the case with empirical evidence, and the potential limitations of the various analyses were acknowledged in the direct testimony of Meta’s experts. Nonetheless, the experts testified that each analysis provided valuable insights into the reliability of the FTC’s subjective market definition hypothesis and all analyses indicated that TikTok and YouTube were closer substitutes for the Meta apps than Snapchat.

The FTC also argued that both the Pricing Experiment and the outage analysis suffered from the “*Cellophane* fallacy” and yielded unreliable results because they evaluate substitution today at the allegedly monopolized “attention price” that resulted from the merger of Facebook and Instagram. Here, however, we evaluate whether TikTok and YouTube are better substitutes than Snapchat for Meta’s apps at that price. We are aware of no reason, and the FTC offered no reason, to expect that the ordering of closeness of substitution from Meta’s apps would differ if the attention price (ad load) that users face would have differed in the absence of the prior merger of Facebook and Instagram.³⁵ As both Professors Carlton and List testified at trial, it’s hard to conceive that the relative diversion from Meta apps to TikTok and Snapchat would be materially affected by ad loads on Meta apps and the small impact of ad load on user engagement established in internal Meta experiments.

Furthermore, the merger simulation, described below, completely avoids this Cellophane concern. As discussed above, the de-merger simulation provides a direct test of the FTC’s claim that the Facebook/Instagram merger raised ad load. Moreover, it is not necessary to define a market to perform a merger (or de-merger) simulation.

As highlighted in Judge Boasberg’s opinion, the FTC’s analysis of *Brown Shoe* factors was incomplete, ignoring the role of short-form video that was a key element of engagement on Facebook and Instagram. In Judge Boasberg’s view, the *Brown Shoe* type evidence was consistent with and complementary to the quantitative studies presented by Professors Carlton and List. As noted above, in dismissing the FTC’s proposed market definition and its claims, Judge Boasberg cited these studies, concluding that they “all tell a consistent story: people treat TikTok and YouTube as substitutes for Facebook and Instagram, and the amount of competitive overlap is economically important.”³⁶

B. The FTC Had No Explanation for Why Output Had Increased

The FTC claimed that Meta’s acquisitions of Instagram and WhatsApp had cemented Meta’s position as a monopolist in the PSNS market, harming competition and harming consumers by raising ad load and degrading quality. But these claims could not explain the empirical reality that output grew dramatically after the acquisitions. Indeed, the FTC’s expert did not claim that output would have been higher in the but-for world (without the acquisitions). This posed direct problems for the FTC’s claims that features of the product would have been better or ad load would have been lower in the but-for world compared to the actual world. And although friends and family activity on Meta’s apps has declined, that was due to changes in user activity: people simply post less than they used to about personal activities. The revealed preference of users was for content unconnected to friends and family, which Meta provided in competition with TikTok, YouTube, and other platforms. Overall usage of the apps grew enormously over time despite the decline in engagement with content related to friends and family, which the FTC could not reconcile with its claim of harm.

Nor could the FTC explain its contention that quality had declined given Meta’s development of large numbers of new features for each of its apps, such that apps have greatly increased functionality since the acquisitions took place.

³⁵ For discussion of the *Cellophane* fallacy, see Carlton (2007), *supra* note 21, and Dennis W. Carlton and Jeffrey M. Perloff (2005), *Modern Industrial Organization*, 4th ed., (Boston: Pearson/Addison Wesley), Ch. 19.

³⁶ Opinion, p. 56.

It was clear to Judge Boasberg that the competition Meta faced for users' attention had increased since the acquisitions. At the same time, Meta's profits remained high, ad loads increased, and engagement on Instagram grew rapidly. The FTC claimed Meta engaged in anti-competitive monopoly maintenance, but the more plausible explanation—consistent with all the empirical data—was that Meta delivered what consumers wanted.

VI. POLICY IMPLICATIONS

The FTC's case against Meta was ultimately decided on the basis of the economic evidence which consistently contradicted the FTC's claim that there was a PSNS market consisting only of Meta's apps and Snapchat. The Court's decision was a victory for the use of economic theory and modern, quantitative analysis over the sole use of subjective, qualitative analysis in antitrust.

Using a *Brown Shoe*-type framework, the FTC claimed its qualitative evidence enabled it to define an antitrust market. Documents and statements of the type cited by the FTC can provide a basis for stating a hypothesis about market definition but do not provide direct quantitative evidence of economic substitution. The FTC could have presented data on consumer substitution patterns, but did not.

The Meta case highlights why regulators and courts should be skeptical of purely non-empirical claims regarding market definition when there is empirical evidence available. The FTC's focus on friends and family features of Facebook and Instagram ignores the role of video as an element of competition for users' attention and thus mechanically excludes TikTok and YouTube. The FTC could have cited, but did not, the qualitative evidence in many documents and industry sources that highlighted competition between Meta's apps and TikTok, YouTube, and others. Such documents explain why Judge Boasberg concluded that both the quantitative and a proper evaluation of qualitative evidence lead to the same conclusion about the importance of competition between Meta and TikTok and YouTube.

For similar reasons, the 2023 Merger Guidelines' emphasis on the use of "practical indicia" and related qualitative observations and "broadly characterized" measures of competition between firms in attempting to define markets can, if used in isolation without testing against available data, result in errors. The risk of such errors is especially high in digital markets that are often characterized by services provided to users at a zero pecuniary price. The empirical analyses presented in the Meta case highlight why the approach to market definition in the 2023 Merger Guidelines should be revised or at least refocused.

The court noted that "each of Meta's analyses can be quibbled with." A similar statement can be made of virtually any empirical study. However, the court also noted that the analyses presented by Meta "all tell a consistent story: people treat TikTok and YouTube as substitutes for Facebook and Instagram...." The convergence of the results of a field experiment, multiple natural experiments, and an observational panel study highlight the dangers of relying only on qualitative or subjective evidence to reach conclusions about competition when it is possible to use modern theoretical and empirical tools of economic analysis.



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