# Measuring Markets for Network Goods*

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**Abstract**

Measuring markets is essential for antitrust analysis, but challenging in settings with network effects, where substitution patterns depend on changes in network size. To address this challenge, we conduct an incentivized experiment to measure substitution patterns for TikTok, a popular social media platform. Our experiment, conducted during a time of high uncertainty about a potential U.S. TikTok ban, compares changes in the valuation of other social apps under individual and collective TikTok deactivations. Consistent with a simple framework, the valuations of alternative social apps increase more in response to a collective TikTok ban than to an individual TikTok deactivation. Our framework and estimates highlight that individual and collective treatments can even lead to qualitatively different conclusions about which alternative goods are substitutes.

**Keywords:** Markets, Network Goods, Coordination, Collective Interventions.

**JEL Classification:** D83, D91, P16, J15

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# 1 Introduction

Market definitions are central to antitrust analysis, guiding assessments of market power, competition, and consumer harm. To illustrate their importance, consider the recent U.S. antitrust case against Meta, which hinges critically on defining the "relevant market" in which Meta's platforms compete. The Federal Trade Commission (FTC) argues that the market only comprises "personal social networking services," focusing on platforms like Facebook and Instagram that connect users with friends and family, while excluding other entertainment-based social apps such as YouTube and TikTok. Meta counters that the market should be broader, including all platforms competing for user attention and advertising revenue.[1]

Market definition assessments are informed by empirical estimates of substitution patterns, which capture how the unavailability of a given product affects consumer demand for alternative products—for example, through deactivation studies in the case of digital products (Allcott et al., 2020; Aridor, 2025).[2] Such evidence primarily relies on individual-level interventions, which evaluate changes in demand while holding others' consumption fixed. Yet, in real-world markets, network effects—which arise when demand depends on network size or others' consumption—can play an important role in determining the equilibrium level of demand for alternative products. Obtaining credible estimates that account for network effects is challenging: experiments typically hold network size constant, and natural experiments that provide the necessary variation in network size are uncommon and lack individual-level counterfactuals.

In this paper, we introduce new evidence on the gap between substitution patterns that account for network effects and those that do not. We first show, using a simple conceptual framework, that cross-price elasticities estimated while holding network size fixed generally fail to reflect accurate substitution patterns—potentially even resulting in the wrong sign. Such estimates reflect the direct effect of a change in a product's price on another product's demand, but ignore that the resulting changes in the network sizes will trigger feedback effects on demand that amplify or dampen the initial cross-price response. Therefore, collective interventions, which evaluate changes in demand while allowing others' consumption to adjust, are required to appropriately measure substitution patterns in such

[1] See Federal Trade Commission (2021). For popular press coverage, see "Meta faces April trial in FTC case seeking to unwind Instagram merger" (Reuters, 2024).

[2] Substitution patterns can also be estimated using alternative approaches such as using exogenous price variation (Gandhi and Houde, 2019).

settings.

To test whether network effects influence substitution patterns, we conduct a pre-registered online experiment with 900 active U.S. TikTok users, aged between 18 and 27, recruited from Prolific, a widely used online survey provider. Our experimental design leverages a moment of increased policy uncertainty surrounding a potential U.S. ban of TikTok—one of the most widely used social media platforms at the time, with over 170 million U.S. users. After several months during which a nationwide ban on TikTok seemed increasingly likely, the U.S. government implemented the ban on January 19, 2025, prompting a temporary shutdown of the platform.[3] The uncertainty in the period leading up to the ban allows us to credibly elicit individuals' willingness to accept (WTA) to deactivate various platforms under different potential TikTok ban scenarios. These scenarios isolate the role of network effects and provide insights into the substitution patterns between TikTok and other platforms.

In particular, we examine respondents' incentivized valuations of other social apps using a simple Becker-DeGroot-Marschak (BDM) mechanism (Becker et al., 1964). We focus on three other social apps: YouTube, Instagram, and Snapchat, which are also popular among young adults (Pew Research Center, 2024). Like TikTok, Instagram and YouTube center on algorithmically curated, short-form, visually engaging public content aimed at broad audiences. Snapchat is the most distinct of the platforms, as its primary focus is on ephemeral messaging and personal interactions rather than public content sharing and consumption.

Respondents complete three scenarios for one of the three other social apps. In the "no TikTok ban" scenario, participants are asked how much compensation they would require to individually deactivate their randomly assigned app for four weeks if the TikTok ban does not take place. We then elicit respondents' required compensation to deactivate their assigned app under two additional, randomly ordered, scenarios: 1) the "TikTok ban" scenario, in which the nationwide TikTok ban is implemented, and 2) the "individual TikTok deactivation" scenario, in which the ban does not happen but respondents are required to individually deactivate TikTok in exchange for monetary compensation.[4]

[3]Anticipating the nationwide ban, TikTok voluntarily suspended its U.S. services on January 18, resulting in a roughly 14-hour shutdown. On January 20, President Donald Trump reversed the ban by issuing an executive order postponing enforcement for 75 days to allow for negotiations over the app's ownership and to address national security concerns (Associated Press, 2025).

[4]Respondents estimated a 46% likelihood that the TikTok ban would take effect on January 19, 2025, underscoring that they perceived this scenario as quite likely at the time of our experiment. Reassuringly, this number is close to the 42% average perceived likelihood observed on Polymarket, an online betting

We focus on within-person comparisons, as they increase statistical power and are likely more meaningful than absolute valuation levels, which can be difficult to interpret (Ariely et al., 2003). Our first finding is that the social apps we study are more highly valued when TikTok is collectively banned. To establish this finding, we compute the *net fraction* of users who value a given platform more under the collective deactivation scenario than under the no TikTok ban scenario—that is, the difference between the share of users who value a platform more under the TikTok ban and the share who do so under the no TikTok ban scenario. For Instagram, YouTube, and Snapchat, the net fraction of users who value the platform more in the collective deactivation scenario than in the no TikTok ban scenario is 48.1, 41.8, and 14.8 p.p., respectively ($p < 0.01$, in all cases). This result implies that all three apps are *substitutes* for TikTok under a collective deactivation.

To isolate the role of network effects in driving these substitution patterns, we compare the collective and individual TikTok deactivation scenarios. The corresponding *net fractions* of users with a relatively higher valuation under collective deactivation than under individual TikTok deactivation are 25.0 p.p. for Instagram, 16.0 p.p. for YouTube and 15.5 p.p. for Snapchat ($p < 0.01$, for all). This result highlights the first-order role of network effects in shaping valuations.

Finally, we describe results comparing valuations under the individual TikTok deactivation and no TikTok ban scenarios. For Instagram and YouTube, a substantial net fraction of participants (13.9 p.p. and 24.4 p.p., respectively) value the platform more under the individual TikTok deactivation. In contrast, this net fraction is negative and close to zero for Snapchat. Thus, our results indicate that Snapchat is not perceived as a substitute for TikTok when users leave individually, but it is viewed as one under a collective TikTok deactivation—albeit to a lesser extent than Instagram and YouTube. Since Snapchat primarily functions as a messaging app, coordination among users may be especially important. As a result, an individual-level deactivation of TikTok, leaving network size fixed, might not alone enhance Snapchat's perceived value.

We further support our findings from the incentivized valuation elicitation with two additional pieces of evidence on expected time substitution. First, individuals' own expected time changes align with the patterns observed in the elicitation exercise. We find that a net positive fraction of respondents expect to spend more time on other social apps—namely, Instagram, YouTube, and Snapchat—under the TikTok ban compared to the individual TikTok deactivation. Conversely, intended substitution toward non-social

platform, reflecting the general market sentiment at the time of our experiment.

activities, such as playing phone games or meditating, is weaker under the TikTok ban than under the individual TikTok deactivation. These findings contrast with those from studies using individual-level interventions holding network effects fixed (Aridor, 2025). Therefore, these results showcase that fixed-network interventions tend to underestimate the degree of substitutability between social products and overestimate the substitutability between social and non-social products. This effect could also spillover to other non-digital social activities, such as eating out with friends, where collective treatments may facilitate coordination among individuals.

Second, respondents' expectations about changes in others' time use on Instagram, YouTube, and Snapchat align with their substitution patterns. Individuals who expect an above-median increase in the time their friends spend on the assigned platform exhibit a larger gap in valuation between the TikTok ban and individual TikTok deactivation. This finding further provides evidence that network effects are important determinants of substitution patterns.

One limitation of our findings stems from the self-selected nature of our sample. Specifically, around 82% of respondents who initially started our survey chose to participate in the deactivation study.[5] Beyond observable differences, respondents willing to participate in our deactivation study may differ in unobservable ways from the population of TikTok users. Moreover, our estimates ignore other equilibrium responses besides direct network effects, such as changes in advertising prices (Donati and Fong, 2025).

Notwithstanding these important caveats, our results are relevant to competition policy in markets with network effects. Our estimates suggest that all three social digital platforms become *closer substitutes* to TikTok after accounting for network effects, making it more likely that they are part of the relevant market. The results for Snapchat—a social messaging app—are especially noteworthy through the lens of our framework, as they reveal a qualitative difference in substitution patterns when accounting for network effects. At the same time, our estimates suggest that non-social activities—such as video gaming and meditation—are weaker substitutes for social media, making it less likely that they are part of the relevant market. Thus, network effects may make the market narrower—vis a vis non-social activities—yet broader within the set of social apps.

Our paper speaks to a growing literature on the economics of social media (Aridor et

[5]This fraction is relatively high compared to other deactivation studies, see e.g. Allcott et al. (2024). We believe this likely arises from the nature of the Prolific sample, which is selected on willingness to participate in research studies, compared to the less selected samples invited to the deactivation studies in prior work.

al., 2024). Our study builds on previous research examining the effects of individual-level social media deactivation, with a particular focus on substitution patterns (Mosquera et al., 2020; Brynjolfsson et al., 2023a,b; Allcott et al., 2020, 2022, 2024; Collis and Eggers, 2022; Katz and Allcott, 2025; Aridor, 2025). The most closely related study is Aridor (2025), who estimates substitution patterns for YouTube and Instagram based on an individual-level deactivation study and finds cross-category substitution to other social apps but also substantial diversion rates to non-digital activities. Rehse and Valet (2025) find quantitatively similar substitution patterns among US users in response to a short-lived Meta platform outage.[6] We differ from this literature in our focus on explicitly accounting for network effects in this market.

Further, we also contribute to a longstanding literature in industrial organization that examines consumer choice in the presence of network effects (Rohlfs, 1974; Katz and Shapiro, 1985; Farrell and Saloner, 1985; Rochet and Tirole, 2003). More recently, the literature has documented how product market traps—situations where a large fraction of active users derive negative welfare from the product—in settings with network effects (Bursztyn et al., 2023; Akerlof et al., 2024; Hagiu and Wright, 2025). Despite their importance, network effects have proven challenging to measure and to account for. We contribute to this literature by providing an empirical methodology to credibly shift user beliefs about network adjustments, using a consequential contingent-valuation elicitation (Landry and List, 2007).

Finally, we contribute to a literature examining market power and market definition, particularly in the context of digital platforms (Franck and Peitz, 2019; Calvano and Polo, 2021; Scott Morton et al., 2019), and a literature studying competition in media markets (Anderson and Coate, 2005; Bergemann and Bonatti, 2011; Anderson and De Palma, 2012; Athey et al., 2018; Prat and Valletti, 2022; Anderson and Peitz, 2023). While this literature recognizes that both direct (Aridor, 2022) and indirect network effects (Filistrucchi et al., 2014) affect market definitions, to the best of our knowledge this is the first paper providing empirical evidence of how substitution patterns change after accounting for direct network effects.

[6] Rehse and Valet (2025) find that a 100% reduction in Meta's services leads to a 18.4% increase in non-Meta social media usage, while Aridor (2022) finds that a 100% restriction of Instagram usage leads to a 22.7% increase in the time spent on non-Instagram social applications. A limited network response could explain this similarity. While platform outages can, in principle, capture network effects and the coordination of users on different platforms, the short-lived duration of the 2021 Meta outages (6 hours) studied by Rehse and Valet (2025) restricts this possibility.

## 2 Conceptual Framework

Suppose there are $J$ products. The aggregate demand for product $j$ in a model with network effects is given by $Q_j(p, q)$, where $p = (p_1, p_2, \ldots, p_J)$ is the vector of prices and $q = (q_1, q_2, \ldots, q_J)$ is the vector of quantities. Prices could take the form of monetary prices or advertising loads (Anderson and Coate, 2005). Quantities can represent different units of demand—such as the number of consumers, total time spent, or total amount consumed—depending on the application. Demands are allowed to exhibit not just own network effects (to depend on $q_j$) but also cross-network effects (to depend on $q_k$ for $k \neq j$).[7] We assume that demands are smooth, non-negative, and bounded.

Let $q_j(p)$ denote the equilibrium quantities that result from taking into account network effects. These (possibly non-unique) quantities solve the following fixed-point problem which imposes rational expectations:

$$q = Q(p, q).$$

Consider the case of a small change in the price of product 1.[8] We are interested in the cross-price elasticity that accounts for adjustments in the network structure, $\varepsilon_{j,1} := \frac{dq_j}{dp_1}\frac{p_1}{q_j}$. To understand how network effects change measured substitution patterns, we compare this elasticity to the "fixed-network" elasticity $\epsilon_{j,1} := \frac{\partial Q_j}{\partial p_1}\frac{p_1}{q_j}$ which is computed holding the network sizes fixed.

To fix ideas, a canonical model of network effects à la Katz and Shapiro (1985), with a continuum of individuals who must choose one of two products. Individual $i$'s utility from choosing product $j$ is quasilinear in money and depends on the size of the network, $q_j$:

$$u(q_j) + \gamma_j^i - p_j,$$

where $u$ is a smooth function and $\gamma_j^i$ is the heterogeneous "membership" benefit from joining

[7] Cross-network effects can arise even when the utility from each product depends only on its own user base. For example, with positive own-network effects, an increase in the size of product $k$ raises the utility of choosing that product, which in turn reduces the equilibrium share of users selecting a competing product $j$.

[8] We focus on small price changes for analytical convenience, although our empirical estimates use platform deactivations or bans, effectively corresponding to infinite price increases (or increases above the "choke" point). These second-choice estimates are informative for antitrust investigations but in general differ from estimates based on small price changes (Reynolds and Walters, 2008; Conlon and Mortimer, 2021).

network $j$. We assume that $u$ is either increasing in the size of the network, which will imply that network effects are positive, or decreasing, which will imply negative network effects. We assume that the net benefit from joining network 1, $\gamma^i := \gamma_1^i - \gamma_2^i$, is distributed according to a smooth distribution with density $f$ with full support and that network effects are small enough.[9] In this case, there is a unique equilibrium and the difference $\varepsilon_{2,1} - \epsilon_{2,1}$ is proportional to $u'$.

In other words, the fixed-network elasticity will underestimate or overestimate the degree of substitution between both products depending on whether network effects are positive or negative. Given that the fixed-network elasticity is positive, in the former case there could even be qualitatively different conclusions when considering the cross-price elasticity that accounts for network responses. Intuitively, when the price of 1 increases, there is a direct increase in the demand for product 2—and a corresponding decrease in the demand for 1—holding network effects constant, which is captured in the fixed-network elasticity. However, this elasticity ignores the subsequent impact on the demand for 2 due to the change in the network of both products. For example, when network effects are positive, the partial increase in the demand for 2 will further increase the demand for 2 due to own-network effects. Additionally, the partial decrease in the demand for 1 will reinforce this effect due to cross-network effects—product 2 becomes relatively more attractive since fewer people choose 1. Therefore, both own-network and cross-network effects contribute to the bias of the fixed-network elasticity.

More generally, the presence of network effects opens a gap between the fixed-network and the relevant cross-price elasticities. Focusing on locally-stable equilibria (where the matrix $I - \frac{\partial Q}{\partial q}$ is invertible), the cross-price derivatives that account for network effects are:

$$\frac{\partial q}{\partial p_1} = \left(I - \frac{\partial Q}{\partial q}\right)^{-1} \frac{\partial Q}{\partial p_1},$$

which in general differ from the fixed-network elasticities $\frac{\partial Q}{\partial p_1}$ unless there are no network effects, $\frac{\partial Q}{\partial q} = 0$.

To understand the magnitude and sign of the gap, we focus on the two-product case:

$$\varepsilon_{2,1} = \frac{-\frac{\partial Q_2}{\partial q_1}|\epsilon_{1,1}| + \left(1 - \frac{\partial Q_1}{\partial q_1}\right)\epsilon_{2,1}}{\left(1 - \frac{\partial Q_1}{\partial q_1}\right)\left(1 - \frac{\partial Q_2}{\partial q_2}\right) - \frac{\partial Q_1}{\partial q_2}\frac{\partial Q_2}{\partial q_1}}. \tag{1}$$

[9] As a sufficient condition, we impose the following bound: $u' < (2\|f\|_\infty)^{-1}$.

Consider a scenario when two products are substitutes based on the fixed-network elasticities, $\epsilon_{2,1}$. We focus on the commonly-studied case of locally-stable equilibria where network effects are small enough such that the denominator is positive. In this case, the sign of the difference $\varepsilon_{2,1} - \epsilon_{2,1}$ will largely depend on the sign of the cross-network effects, $\frac{\partial Q_j}{\partial q_k}$. If cross-network effects are negative, the fixed-network elasticities will *underestimate* the strength of substitution to product 2: they ignore the decrease in the demand for product 1 which further increases the demand for product 2. When cross-network effects are positive and large enough, the fixed-network elasticities will *overestimate* the strength of substitution to product 2.[10] In this case, there can even be a qualitative difference—a change in sign—between the substitution patterns inferred from fixed-network elasticities and the relevant cross-price elasticities.

# 3 Measuring Markets Using a Deactivation Experiment

To quantify the role of network effects in shaping substitution patterns, we conducted an experiment shortly before the Supreme Court ruling on the TikTok ban in the United States. The uncertainty surrounding this decision enables us to compare valuations of various alternative apps across three plausible scenarios for TikTok's future: 1) a status quo scenario where TikTok is not banned, 2) a scenario where Tiktok is not banned and users individually deactivate their TikTok accounts, and 3) a scenario in which TikTok is banned for all users.

## 3.1 Study context: TikTok ban in January 2025

Over the past years, U.S. officials have warned that TikTok could be used by the Chinese government to collect sensitive information or influence public opinion. These national security concerns over foreign access to Americans' personal data prompted Congress to pass a "sell-or-ban" law against Tiktok in April 2024. The law required ByteDance, TikTok's parent company, to sell its U.S. operations within nine months or face a nationwide ban starting January 19, 2025.

TikTok challenged the law in court, culminating in a critical Supreme Court hearing on January 10th, 2025. Nevertheless, the Supreme Court upheld the law on January 17, 2025, affirming the government's authority to act on national security grounds. A shutdown was

[10] Concretely, this case requires: $\epsilon_{2,1}\left[\left(1-\frac{\partial Q_1}{\partial q_1}\right)\frac{\partial Q_2}{\partial q_2}+\frac{\partial Q_1}{\partial q_2}\frac{\partial Q_2}{\partial q_1}\right] < \frac{\partial Q_2}{\partial q_1}|\epsilon_{1,1}|$.

widely expected, and TikTok suspended its U.S. operations on January 18, 2025. Two days later, President Trump signed an executive order delaying enforcement for 75 days to allow for Tiktok to negotiate with potential American buyers.

As a result, leading up to the ban, American TikTok users were plausibly uncertain about their ability to use TikTok after January 19, providing us an opportunity to leverage this policy uncertainty for our experiment in early January 2025.[11]

### 3.2 Sample

**Sample characteristics** We recruited 900 respondents from the online survey provider Prolific between January 6 and January 9, 2025, prior to the Supreme Court appeal on January 10.[12] Our sample consists of participants from the U.S. aged between 18 and 27 who own iPhones and are active TikTok users.[13] We focus on this demographic as young adults are among the most active on social media platforms, and especially on TikTok. Indeed, as of 2022, approximately 54% of US TikTok users are between the ages of 18 and 29 (Pew Research Center, 2022). Among participants who began our survey, 81% were active TikTok users. From these participants, 82% agreed to participate in the four-week deactivation study, which, if selected, would require them to upload screenshots of their iPhone screen time usage to verify deactivation compliance. While this restriction implies sample selection, the degree of selection is smaller than in existing deactivation studies.[14] We suspect the high consent rate in our experiment results from using the Prolific subject pool, which is likely more inclined to participate in studies of this type, due to selection and/or more prior survey-taking experience, compared to samples recruited via social media.[15] After the consent process, the survey includes two comprehension checks on the method of compliance and the length of the deactivation—correctly answered by

[11] For press coverage, see "TikTok starts restoring service in the U.S. after shutting down over ban concerns" (CBS News, 2025).

[12] For popular press coverage, see "Supreme Court appears inclined to uphold TikTok ban in U.S." (Reuters, 2025).

[13] We recruit iPhone users as we require screenshots from Screen Time usage to monitor phone app deactivation, which is simplified on iOS devices.

[14] We also collect data on why respondents chose not to participate in the deactivation study and find that they mainly report concerns over heavily relying on their phones and uncertainty about which apps they would be asked to deactivate. We chose not to pre-specify the apps that participants may be asked to deactivate prior to consent to minimize concerns over differential attrition. Indeed, we find that the attrition rate at the consent stage is 18.0%, 17.5%, and 18.6% for Instagram, YouTube, and Snapchat, respectively. These differences are not statistically significant.

[15] The specific instructions participants receive before consenting into the deactivation study can be found in Appendix Section B.

94% and 84% of participants, respectively.[16]

**Summary statistics** Our sample includes 67% female participants, closely reflecting the proportion of U.S. TikTok aged 18-29 users who are female (70.9%; Pew Research Center 2022). The average age is 23.5 years old. Additionally, 49% of participants are students and 46% are single. At baseline, respondents spend an average of 103 minutes per day on TikTok, with 74% using the platform daily. On average, participants also spend 80 minutes per day on YouTube, 52 minutes on Instagram, and 31 minutes on Snapchat.

**Pre-registration** The pre-registration for the data collection can be found on AsPredicted #206616.[17] It provides information on the study design, hypotheses, primary and secondary outcomes, sample size, and criteria for excluding participants from the sample.

### 3.3 Design

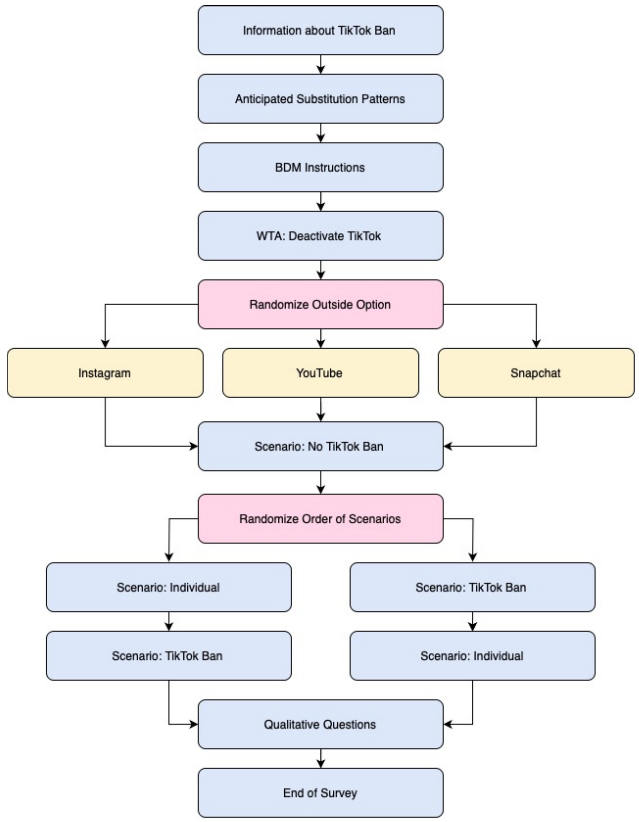
Our design aims to measure people's valuation of alternative apps that could be a substitute for TikTok. In particular, it allows us to evaluate how the valuations of these alternative apps depend on whether TikTok consumption is reduced individually or collectively. Details on the experimental instructions can be found in Appendix B. Further, the experimental design overview is described in Figure 1.

**Background Information on the Ban** We begin the experiment by providing all respondents with information about the potential TikTok ban in the U.S. Specifically, they are presented with the following details:

> Over the past year, U.S. lawmakers and officials have expressed concerns about data privacy and misinformation on TikTok, which is owned by the Chinese company ByteDance.
>
> In April, the U.S. government enacted a law requiring TikTok to be sold to another company or face a ban on operating in the United States.
>
> The ban is scheduled to take effect on January 19th, 2025. However, the Supreme Court has agreed to hear TikTok's appeal on January 10th. As a

[16] We do not collect data for participants who fail either of these questions, as pre-specified.
[17] For details, see `https://aspredicted.org/d55q-yw33.pdf`.

**Figure 1:** Structure of the experiment: TikTok Ban Study




*Notes:* Figure 1 displays the structure of our experiment. Participants begin by receiving information about the upcoming TikTok ban and subsequently answer questions regarding their anticipated time substitution patterns to other social apps. Next, the survey provides instructions for the BDM mechanism, followed by the elicitation of participants' WTA for individually deactivating TikTok in the absence of a ban. Participants are then randomly assigned one of three alternative platforms (Instagram, YouTube, or Snapchat), after which their WTA is elicited under three distinct scenarios. Initially, participants indicate their WTA for deactivating their assigned alternative platform assuming that no TikTok ban occurs. Subsequently, the individual TikTok deactivation scenario (participants are asked to individually deactivate TikTok when no TikTok ban occurs) and the TikTok ban scenario (TikTok is banned in the U.S.) are presented in random order. In each scenario, participants specify their WTA to deactivate the assigned alternative platform. The study concludes with participants providing qualitative responses on anticipated substitution to non-social activities, network effects, and social media use, and demographic questions. In the schematic diagram, yellow boxes denote embedded data, blue boxes indicate question sections, and pink boxes highlight randomization points.

result, it is possible that TikTok will be banned for all users in the United States on January 19th.

**WTA Elicitation Instructions** Next, we explain our WTA elicitation method to respondents, designed to measure their valuation of their alternative platform. We employ a BDM elicitation method, which is explained to respondents in simple terms. Specifically, we ask participants to indicate the minimum amount of money they would require to deactivate their assigned app for four weeks under each scenario. We allow for an upper limit of $500 and a lower limit of $0.[18] A series of best practices are implemented in our elicitation process. First, we include a practice app (Facebook) to familiarize respondents with the BDM elicitation when presenting the instructions. Second, we ensure high data quality by only allowing respondents who pass a comprehension question on the BDM elicitation to participate in the experiment.[19] Third, we ask respondents whether they agree with the valuation implied by their responses. If respondents disagree with their initial valuation, they are given the opportunity to retake the question once.[20] We incentivize our experiment by informing participants that 1 in 10 respondents will be randomly selected to take part in the deactivation study, for the scenario based on whether the TikTok ban is implemented on January 19th, 2025.[21]

### 3.3.1 Deactivation Scenarios

Our experiment then examines how people value alternatives to TikTok under three different scenarios. Each participant is randomly assigned one of either Instagram, YouTube, or Snapchat as their alternative platform.

[18]We have minimal top or bottom coding issues as we find that only 7.78% of respondents enter $500 and only 3.22% enter $0.

[19]As pre-specified, we do not collect data for participants who fail the BDM comprehension check. 15% of participants fail this check.

[20]If respondents disagree a second time, they proceed with the survey, and their second attempt is recorded as their final response. As pre-specified we exclude them from our analysis. Reassuringly, across all elicitations, we find that only 1.6% of first choices are regretted and only one respondent regrets their choice twice.

[21]Our methodology therefore also relates to the literature on contingent valuation in economics that measures the value of non-market goods through hypothetical surveys but has been shown to be subject to hypothetical bias (Landry and List, 2007; List, 2001). We address this bias by exploiting real policy uncertainty surrounding a potential TikTok ban to incentivize our experiment.

**No TikTok ban scenario** We start with the *no TikTok ban scenario*, which serves as our baseline, where TikTok remains fully available. Participants are asked how much compensation they would require to deactivate their assigned alternative platform, such as Instagram, for four weeks. Specifically, respondents are provided with the following instructions:

> Assume that TikTok wins the appeal and remains available to all users in the U.S. after January 19th.
>
> In this scenario, how much would we need to pay you (in U.S. dollars) to deactivate your [platform] account for four weeks?

Next, we elicit respondents' valuations of the alternative app under two additional scenarios, presented in random order.

**Individual TikTok deactivation scenario** The *individual TikTok deactivation scenario* enables us to measure how a respondent's valuation of an alternative platform changes when they personally lose access to TikTok, holding others' consumption fixed. Here, TikTok is not banned for the general public, but the respondent is asked to deactivate their personal TikTok account for four weeks in exchange for a monetary payment exceeding their previously stated valuation.[22] We then ask how much additional compensation they would require to also deactivate their assigned alternative platform. Participants receive the following instructions:

> Assume that TikTok wins the appeal and remains available to all users in the U.S. after January 19th. This means the general public in the U.S. can continue using TikTok as usual.
>
> Additionally, assume the random draw exceeds the valuation you provided to deactivate TikTok for four weeks in a previous question, and we ask you to deactivate your TikTok in exchange for this payment.
>
> In this scenario, how much additional money would we need to pay you (in U.S. dollars) to also deactivate your [platform] account for four weeks?[23]

[22]Before measuring their valuation of alternative apps in the three scenarios, we elicit how much compensation respondents require for an individual TikTok deactivation in an incentivized manner. This allows us to credibly identify valuations of alternative apps for the scenario of an individual TikTok deactivation.

[23]In the individual TikTok deactivation scenario, participants are paid to deactivate their personal TikTok accounts, ensuring that the alternative platform deactivation is incentivized. As a result, there is a

**TikTok ban scenario** Finally, the *TikTok ban scenario* explores a situation in which TikTok becomes unavailable to all U.S. users. This scenario allows us to examine how alternative platform valuations shift when there is a collective TikTok ban, which allows us to isolate the role of network effects on respondents' valuations, when compared to the individual scenario. Participants in this condition are told:

> Assume that TikTok loses the appeal and is banned in the U.S. on January 19th. The TikTok ban would apply to everyone in the U.S., including you.
>
> In this scenario, how much would we need to pay you (in U.S. dollars) to deactivate your [platform] account for four weeks?

**Design Discussion** The key advantage of our approach is that it measures people's incentivized—rather than hypothetical—valuations in a scenario where both an individual and collective deactivation are plausible outcomes, due to the substantial legal uncertainty. This uncertainty is reflected in respondents' perceived likelihood of the ban occurring, as well as in predictions from Polymarket, one of the world's largest live prediction markets, at the time of our experiment. In particular, we find that participants, on average, assign a 46% likelihood to the TikTok ban taking place, closely aligned to the average perceived likelihood of 42% on Polymarket at that time, as seen in Appendix Figure A2.

An important feature of our experimental design is its ability to facilitate within-subject comparisons. Specifically, the design allows us to observe how valuations change across three distinct scenarios: (1) no deactivation, (2) individual TikTok deactivation, and (3) collective deactivation. Additionally, employing a within-subject comparison enhances our statistical power, especially since we aimed to elicit valuations for multiple platforms but faced limitations due to Prolific's sample-size constraints for our target demographic.

### 3.3.2 Alternative Apps

We consider three popular alternative apps in the deactivation experiment: Instagram, YouTube, and Snapchat. These platforms were chosen due to their established presence as content-sharing platforms that, to varying degrees, share some functional similarities with TikTok.

potential income effect for those in the individual TikTok deactivation group. Consistent with the previous literature, we find it plausible that income effects are small. Moreover, our self-reported time-use intentions are immune to income effects, yet they exhibit the same qualitative patterns as our incentivized measures. This suggests that income effects are unlikely to be quantitatively large in our experiment.

**Instagram** Instagram shares many relevant characteristics with TikTok. Both platforms contain visually engaging, short-form content, and encourage user interaction through algorithmic feeds. TikTok's "For You" page offers a highly personalized content discovery experience, while Instagram's discovery features, including Reels and hashtag-based browsing, serve a similar purpose. Both platforms also play a significant role in creator-driven trends and influencer engagement. Additionally, both Instagram and TikTok users have personal profiles where they can post content to their followers. Both platforms also allow users to privately message one another. However, there are notable differences between the platforms—in particular, Instagram originated as a photo-sharing app, and photos continue to be a central means of interaction among users, often within their existing social circles.

**YouTube** YouTube also shares key features with TikTok but differs in important structural ways. Both platforms center on user-generated video content, use algorithmic feeds to drive engagement, and offer monetization tools to attract and retain creators. Additionally, YouTube Shorts—launched in 2020 after TikTok was banned in India—[24] significantly expanded YouTube's presence in the short-form video space, enabling it to compete more directly against TikTok.

Yet, the platforms diverge in content format, creator incentives, and user behavior. TikTok is optimized for short, vertically shot videos and passive discovery through the "For You" feed, encouraging rapid consumption and virality. YouTube, by contrast, supports a broader range of content lengths and genres, from 30-second Shorts to multi-hour documentaries, and often attracts users seeking specific content through search. Its monetization model–anchored in ads and subscriptions–is more established and tends to provide higher, more consistent payouts, especially for long-form video creators. This supports different creator trajectories, with many using TikTok as a discovery tool and migrating to YouTube for deeper storytelling and more stable income.

**Snapchat** While Snapchat is also a social app, it is the most distinct of the three platforms because of its primary focus on ephemeral messaging and personal interactions, rather than short-form video consumption or public content sharing. While Snapchat Stories and Spotlight offer video features that bear some resemblance to TikTok's format, the platform remains primarily oriented toward more private, interpersonal communication.

[24] "YouTube Shorts launches in India after Delhi TikTok ban" (The Guardian, 2020).

Given these differences, Snapchat is less directly comparable to TikTok in terms of how content is created, distributed, and consumed. However, Snapchat remains widely popular among young adults for connecting socially, and could plausibly serve as an alternative to TikTok for many users if TikTok were banned.

## 3.4 Results

### 3.4.1 Incentivized Valuation of Other Platforms

As pre-registered, our main analysis focuses on the proportion of respondents with higher, equal, or lower valuations across the different scenarios, as these measures are robust to concerns about measurement error in continuous WTA elicitations. For ease of exposition, Figure 2 displays the substitution patterns across three platforms when TikTok is individually deactivated or collectively banned compared to the no ban scenario. Each color reports the fraction of individuals whose WTA for an alternative app is higher or lower under one treatment scenario relative to another. The values above the bars report the difference between the two bars, indicating the net fraction of responses with a higher valuation. Positive net values indicate that, on net, more individuals place higher value on the alternative app under one scenario compared to another, suggesting stronger substitutability between that platform and TikTok.

We present three sets of comparisons. The two green bars per platform indicate the share of individuals whose WTA for the alternative app is higher or lower under the *TikTok ban* than under the *no TikTok ban* scenario.[25] The two dark blue bars show the same values for the *TikTok ban* and *individual TikTok deactivation* scenarios. The light blue bars compare *individual TikTok deactivation* to the *no TikTok ban* baseline.

Across platforms, the results point to a systematic pattern: outside platforms become significantly more valued substitutes for TikTok when the deactivation is collective compared to individual. For Instagram and YouTube, the net difference between green bars is large and positive (48.1 p.p. and 41.8 p.p., respectively), indicating that a TikTok ban leads to a substantial net share of users placing a higher valuation on these alternatives compared to the no TikTok ban scenario. The corresponding difference between dark blue bars (25.0 p.p. for Instagram and 16.0 p.p. for YouTube) point to a quantitatively important role of network effects in driving overall changes in valuations by comparing valuations in the collective scenario against the individual TikTok deactivation scenario.

[25] The remaining proportion of responses have equal WTA between the two scenarios.

Snapchat exhibits a somewhat different pattern. The net effect under individual TikTok deactivation is near zero (−0.7 p.p.), but becomes significantly positive under the TikTok ban, both relative to individual TikTok deactivation (15.5 p.p.) and the no TikTok ban scenario (14.8 p.p.). This qualitative shift suggests that Snapchat is not perceived as a substitute for TikTok when users exit individually, but becomes one only in the collective deactivation.

Since Snapchat primarily functions as a messaging app, coordination among users may be especially important. As a result, an individual-level deactivation of TikTok, leaving network size fixed, might not immediately enhance Snapchat's perceived value.

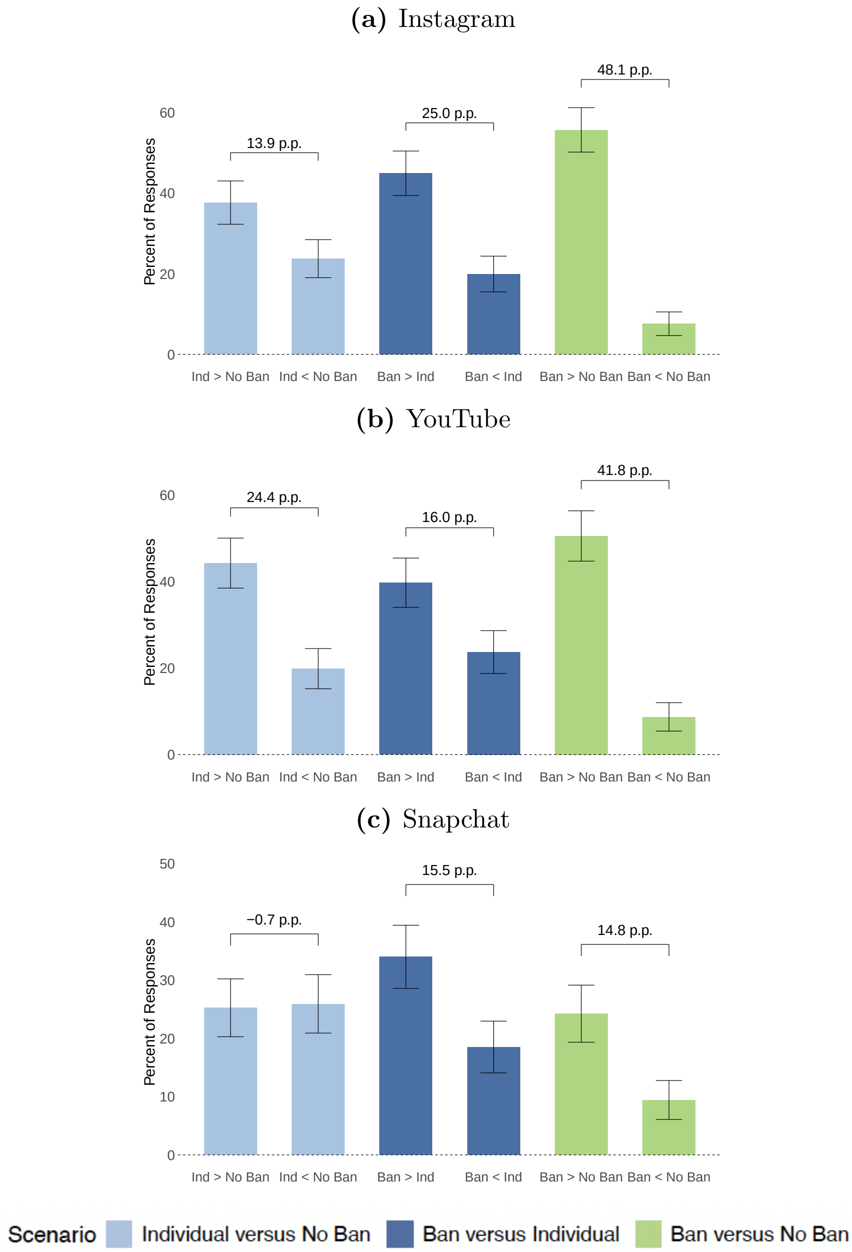
Our results suggest that a collective deactivation makes these three platforms *closer substitutes* to TikTok, highlighting how network effects may play a key role in making markets broader within the category of social apps (social media and messaging apps). The results for Snapchat are particularly interesting through the lens of our framework, as they reveal a qualitative difference in estimates between the individual and collective treatments.

**Average WTA** Next, we present pre-registered results for the average valuation of the alternative apps, which speaks to respondents' preference intensity. Figure 3 illustrates how the average valuation of alternative apps differ across three scenarios.

The light green bars in Figure 3 show that the WTA to deactivate the alternative app under a TikTok ban is significantly higher than under the no TikTok ban scenario: by \$21.13 ($p < 0.01$) for Instagram, \$22.69 ($p < 0.01$) for YouTube, and \$7.72 ($p < 0.05$) for Snapchat. The dark blue bars isolate the role of network effects: collective deactivation raises WTA by \$13.66 ($p < 0.01$), \$12.1 ($p < 0.01$), and \$7.84 ($p < 0.01$) compared to individual TikTok deactivation for Instagram, YouTube, and Snapchat, respectively. These differences correspond to increases of 16.4%, 14.3%, and 10.6%, respectively, relative to baseline valuations in the no TikTok ban scenario. Finally, the light blue bars capture the more muted differences between individual TikTok deactivation and the no TikTok ban scenario, with corresponding differences of \$7.48 ($p = 0.052$), \$10.59 ($p < 0.01$), and –\$0.12 ($p = 0.951$), respectively. Taken together, we find that ignoring network effects leads to an underestimation of substitutability with other social apps and even produces qualitatively different conclusions about whether Snapchat is a substitute for TikTok.

We next interpret the effect sizes comparing the difference between collective and individual TikTok deactivation to the difference between the collective deactivation and the no

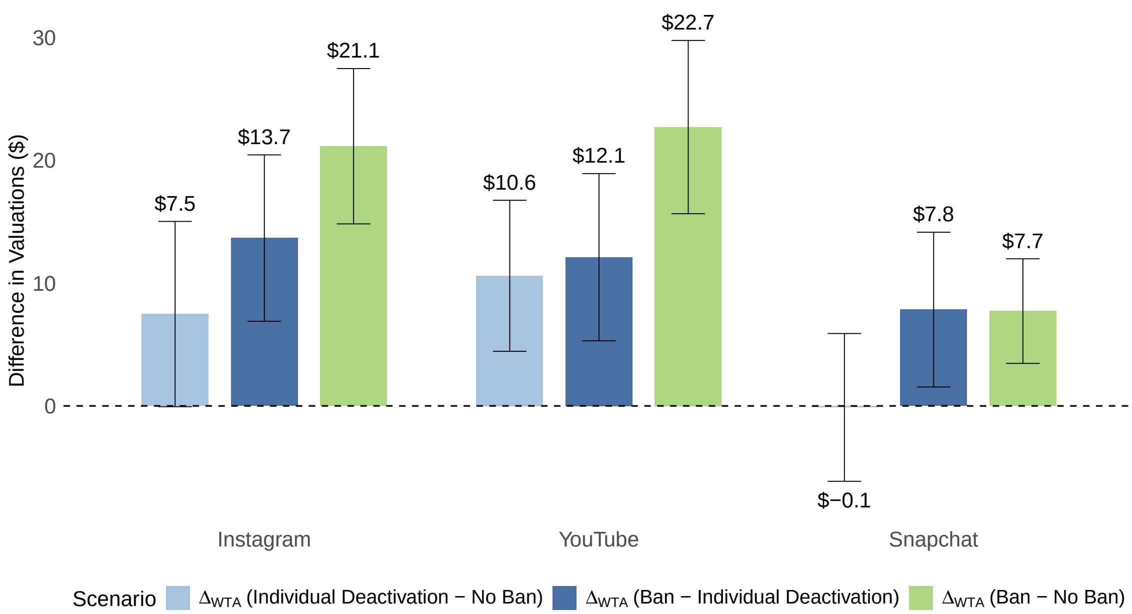
**Figure 2:** Fraction with Higher or Lower Valuation By Scenario




*Notes:* By platform, Figure 2 illustrates differences in the valuation of alternative apps across three scenarios: no TikTok ban, individual TikTok deactivation, and a TikTok ban. Panel a) is for Instagram, b) for YouTube, and c) for Snapchat. For each platform, the light blue bars shows the proportion of individuals who have a higher or lower WTA to deactivate their alternative option platform during individual TikTok deactivation compared to the no TikTok ban scenario. The value above the two bars displays the net fraction with a higher WTA. The dark blue bars present the same proportions when comparing the TikTok ban to individual TikTok deactivation. Similarly, the green bars display the same proportions when comparing the collective TikTok ban compared to the no TikTok ban scenario. The error bars represent 95% confidence intervals.

TikTok ban scenario. For Instagram, network effects account for approximately 65% of the overall treatment effect. For Snapchat, they make up 100% of the overall effect. Finally, for YouTube they make up over 50% of the overall effect. Taken together, these patterns underscore that network effects account for over half of the total effect of the TikTok ban on participants' valuation of the other social apps we consider.

**Figure 3:** Average Difference in Valuations Across Scenarios by Platform




*Notes:* Figure 3 illustrates the differences in continuous valuations of the alternative app across our three scenarios. The light blue bars depict the average difference between valuations under the individual TikTok deactivation scenario and the no TikTok ban scenario. The dark blue shade bars show the difference in average valuation between the TikTok ban and the individual TikTok deactivation scenario. The green bars represent the average difference in respondents' valuations of the platform between the TikTok Ban scenario and the no TikTok ban scenario. The error bars indicate 95% confidence intervals.

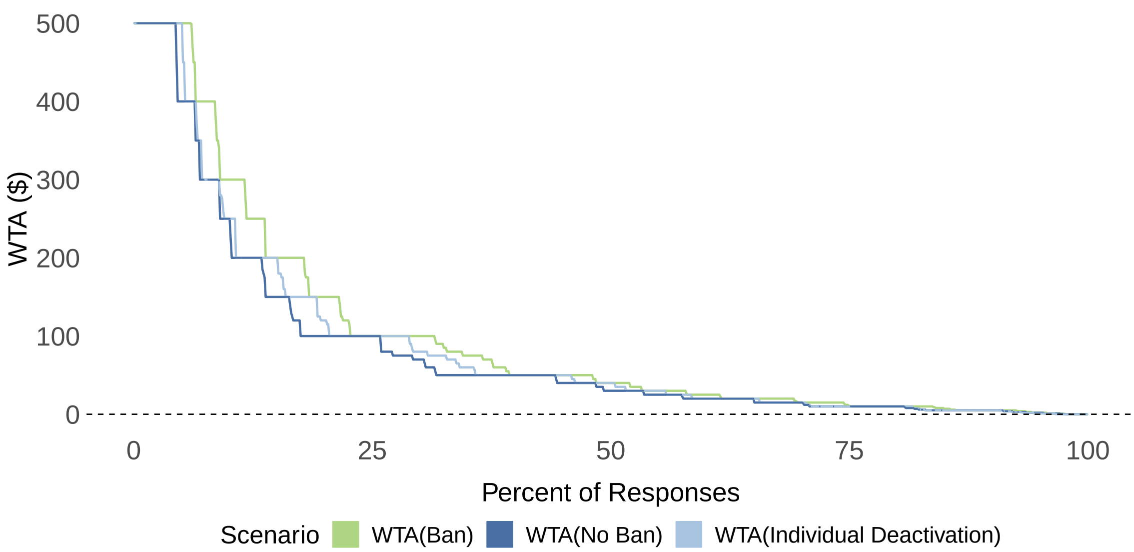
**Inverse demand curve** Figure 4 displays the inverse demand curve for respondents' WTA for deactivating their assigned alternative app for each scenario pooled across platforms.[26] Each point on the curve reflects the share of individuals whose WTA for losing access exceeds a given dollar amount. Based on our elicitation method, the values are bounded between $0 and $500 dollars. The green curve represents valuations under a *TikTok ban*, the light blue curve corresponds to the *individual TikTok deactivation*, and the

[26] Appendix Figures A9 to A11 display the disaggregated results.

dark blue curve reflects valuations under the *no TikTok ban* scenario.

Notably, we find that WTA under the *TikTok ban* scenario results in a rightward shift of the inverse demand curve relative to the *no TikTok ban* scenario. The inverse demand curve corresponding to the *individual TikTok deactivation* scenario lies between the other two scenarios. As displayed in Figure 4, we see that the rightward shift for the *TikTok ban* scenario occurs almost exclusively in the first 50% of respondents. This suggests that cross-network effects are larger in absolute magnitude (more negative) for individuals who already place an above average value on the alternative platform in the baseline scenario.[27]

**Figure 4:** Inverse Demand Curves (Pooled)




*Notes:* Figure 4 displays the inverse demand curve for respondents' incentivized willingness-to-accept (WTA) for deactivating the social app (Instagram, YouTube or Snapchat) for four weeks under three scenarios. The green curve shows WTA under the TikTok ban scenario. The dark blue curve shows WTA under the status quo scenario, where no TikTok ban and no individual TikTok deactivation occur. Finally, the light blue curve shows WTA under the individual TikTok deactivation.

[27]This is consistent with cross-network effects increasing in absolute magnitude with respect to baseline usage, which itself correlates with baseline WTA. Higher baseline usage may reflect stronger individual attachment to the platform and thus greater responsiveness to changes in network size. Respondents with the lowest baseline WTA may represent non-users of the alternative platform, who experience no extensive-margin responses to network effects, resulting in minimal shifts in demand. Conversely, at high baseline WTA levels (inframarginal users), shifts may diminish due to ceiling effects in usage or an already large network size.

### 3.4.2 Self-reported substitution intentions

While the previous results provide incentivized estimates on substitution patterns in terms of platform valuation, they do not directly speak to changes in time use. Given that advertising is the primary revenue source for most social media platforms, it is natural to consider a more direct measure of quantity: the time users spend on the platform. We therefore examine respondents' self-reported substitution intentions. Specifically, respondents were asked whether they planned to spend more, less, or the same amount of time on a given app or activity in the event of a TikTok ban compared to an individual TikTok deactivation. We use these self-reported questions to explore substitution patterns toward a broader range of activities that are harder to capture with incentivized measures.

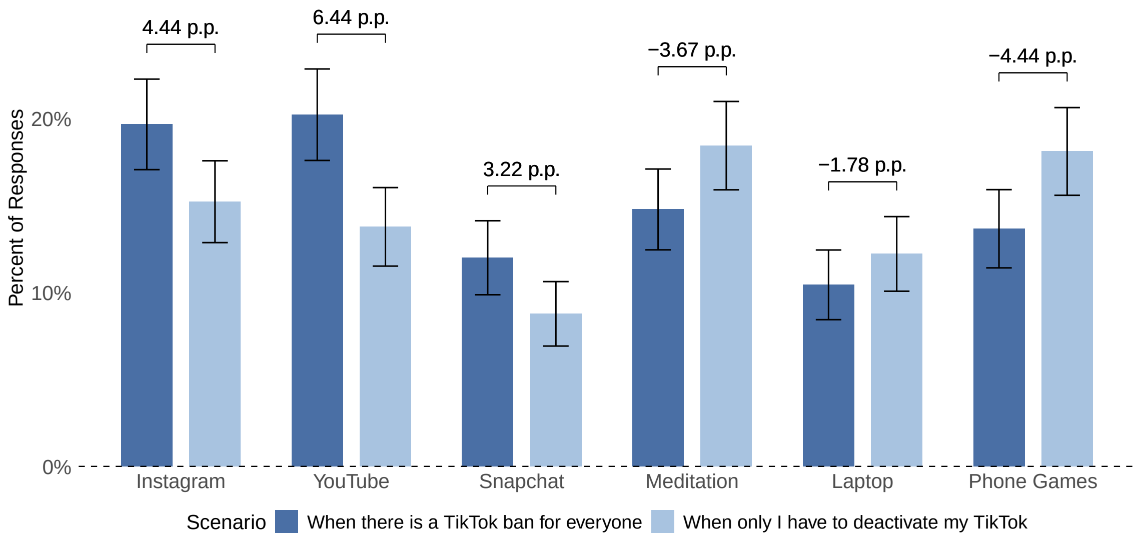
Figure 5 shows the proportions of respondents who expected to spend more or less time on a given activity under collective versus individual TikTok deactivation. We define the net substitution as the percentage of respondents intending to spend more time on a given activity under collective TikTok deactivation minus the percentage intending to do so under individual TikTok deactivation. As shown in Figure 5, the self-reported substitution intentions align with the incentivized valuations for YouTube, Instagram, and Snapchat. First, we find that people predict spending more time on other social apps. In particular, we find a net positive difference of 4.44 p.p. ($p < 0.05$), 6.44 p.p. ($p < 0.05$), and 3.22 p.p. ($p < 0.05$) of respondents who expect to spend more time on Instagram, YouTube, and Snapchat, respectively, under a ban relative to an individual TikTok deactivation of TikTok.[28] In contrast, we find evidence that people predict spending more time on non-social activities under the individual TikTok deactivation, such as playing phone games or meditating, where we find a net negative difference of 4.44 p.p. ($p < 0.05$) and 3.67 p.p., respectively ($p = 0.056$). We also find that people plan to spend somewhat less time on their laptop in the individual TikTok deactivation scenario, but this effect is not statistically significant ($p = 0.30$). As highlighted by our conceptual framework, positive cross-network effects between TikTok and these non-social activities can explain the anticipated reduction in time spent on gaming and meditation under a collective, rather than individual, TikTok deactivation.

Our estimates suggest that digital social platforms, broadly defined, become closer substitutes to TikTok once network effects are considered, increasing the likelihood that they belong in the relevant market. Individual-level interventions thus underestimate substitu-

[28] Note that the exact mapping of valuation of alternative apps and time use on these apps is not clear, as shown in Beknazar-Yuzbashev et al. (2024).

tion toward other social apps. At the same time, non-social digital activities appear to be less close substitutes for TikTok after accounting for network effects.

**Figure 5:** Fraction with Higher or Lower Predicted Time Spent Under Collective vs. Individual Deactivation




*Notes:* Figure 5 illustrates how respondents' predicted time spent using alternative platforms and on activities differs between the TikTok ban (collective deactivation) and individual TikTok deactivation scenarios. Dark blue bars represent the percentage of respondents who intend to spend more time on a given activity under the TikTok ban scenario compared to the individual TikTok deactivation scenario, while light blue bars represent the percentage who intend to spend more time on the same activity under individual TikTok deactivation. We define net substitution as the difference between these two values. Positive values indicate a net shift toward the activity under the collective TikTok ban scenario, while negative values indicate a shift toward the activity under individual TikTok deactivation. The error bars represent 95% confidence intervals.

**Anticipated time substitution patterns** To validate the incentivized WTA measure, we collect data on how participants expect their time spent on various social apps to change under our two new scenarios: an individual TikTok deactivation and a TikTok ban. As shown in Appendix Figure A1, participants anticipate increasing their time spent on alternative platforms in both the individual and collective treatment scenarios. Note that, while qualitatively similar, the estimates in Figure A1 differ from those presented in Figure 5. This arises from the fact that Figure 5 displays data based on a question asking respondents to evaluate their likely time spent under a collective versus an individual TikTok deactivation, while the data in Figure A1 relies on a question where respondents are asked to evaluate the likely time spent under a collective and an individual TikTok deactivation compared to the no-ban scenario.

As shown in Appendix Figure A14, we find that participants who predicted above-median increases in time on their assigned platform exhibit a higher WTA for deactivating TikTok, compared to the no TikTok ban scenario, in both the collective ($p < 0.01$) and individual ($p < 0.01$) treatment conditions.

### 3.5 Anticipated network effects

To more directly speak to the role of network effects in explaining differences between our individual and collective treatments, we also collect data on participants' expectations about how their friends would substitute toward other platforms if TikTok were banned. Through the lens of our conceptual framework, these anticipated changes in the network sizes of alternative platforms following a TikTok ban reflect shifts in both own-platform and cross-platform network effects—the two key mechanisms driving differences in substitution patterns between individual and collective interventions.[29] As shown in Figure A12, 93%, 86%, and 66% of respondents expect their friends to increase time spent on Instagram, YouTube, and Snapchat, respectively, under a TikTok ban compared to current usage levels. These patterns broadly reflect respondents' expectations of substantial changes in network size of other social apps resulting from collective interventions.

Moreover, as shown in Figure 6, we compare average valuation differences across scenarios based on anticipated change in network size. Respondents who anticipated above-median changes in their assigned platform's network size due to the TikTok ban exhibited significantly larger shifts in valuations between the TikTok ban and individual TikTok deactivation scenarios than respondents who anticipated below-median changes ($p < 0.01$). These patterns are consistent with network effects playing an important role in defining markets for network goods.[30]

### 3.6 Robustness

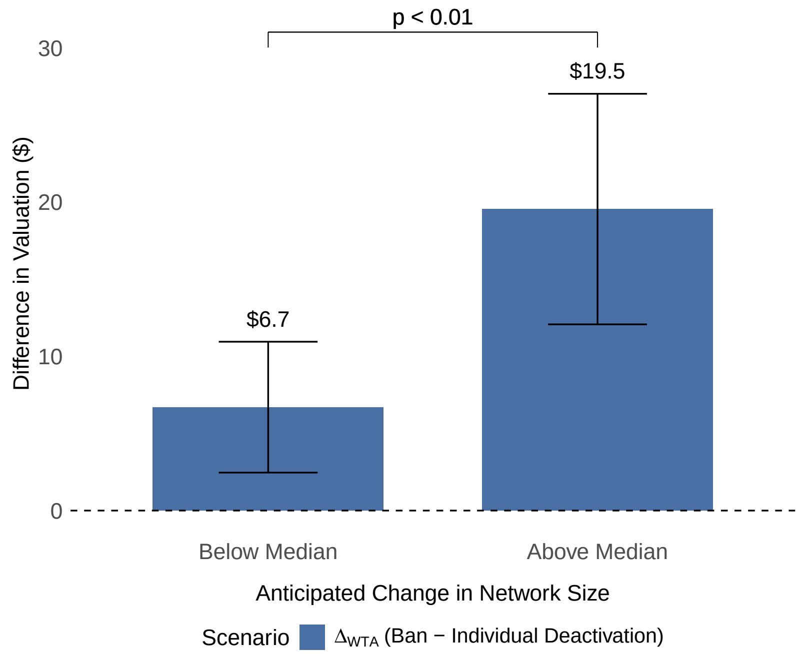
In this section, we report a few robustness checks.

**Perceived Probability** The key challenge in studying valuations under collective deactivation scenarios is their potentially low credibility. Given the large amount of uncertainty

[29]Note, due to a coding error we only collect this data for YouTube for 57% of participants.

[30]This pattern also holds when looking at the individual platforms (see Appendix Figure A13).

**Figure 6:** Individual versus Collective Treatment Effect and Anticipated Network Change (Pooled Across Platforms)




*Notes:* We ask respondents a question on their anticipated network change: "If the TikTok ban happens for everyone in the U.S., the amount of time I would expect my friends to spend on [platform X]..." with answers being on a 7-point likert scale ("Strongly decrease", "Decrease", "Slightly decrease", "Not change", "Slightly increase", "Increase", "Strongly increase"). The figure displays the average change in WTA between the ban scenario and the individual TikTok deactivation separately for respondents with below- and above-median anticipated changes in their network size. The error bars represent 95% confidence intervals

about the TikTok ban, we found it ex ante likely that respondents would perceive the TikTok ban to be relatively plausible. To quantify the perceived credibility of the ban, we directly elicit participants' beliefs about the probability of the TikTok ban occurring on January 19, 2025. On average, respondents report a perceived likelihood of 46%. Additionally, this perceived likelihood is similar in magnitude to respondents' perceived probability (52%) of being asked to deactivate their TikTok accounts if the ban does not occur and they are selected for the deactivation stage. We show in Appendix Table A2, Figure A3, and Figure A4 that our results are robust to focusing on participants with either an above or below median perceived likelihood for either event.

**Dropping regretters** Next, we examine the robustness of our findings depending on whether respondents agree with the valuation implied by their responses. In Appendix Table A3 and Figure A5, we show that our estimates are robust to dropping anyone who regrets at least one of their choices in any of the four WTA elicitations (9.4%)..

**Order of treatments** Recall that we randomly varied the order in which we presented the TikTok ban and individual TikTok deactivation scenarios during the experiment. We find that our results remain consistent regardless of the order of elicitation in Appendix Table A4, Table A5, Table A6, Figure A6, Figure A7, and Figure A8.

**Compliance** We randomly selected 1 out of 10 participants for the deactivation study. After the random BDM draw, 55 participants were invited to deactivate their assigned alternative app based on their reported valuation. A majority (60%) of participants agreed to participate.[31] The compliance rate with the deactivation was 76%, which provides further support that our design was perceived as credible by participants. Importantly, we find no differential compliance rate across platforms. We have a 70% compliance rate for people in our deactivation group for the YouTube app (7 out of 10), 80% for people in our deactivation group for the Instagram app (8 out of 10) and 77% for people in our deactivation group for the Snapchat app (10 out of 13).[32]

## 4 Conclusion

In this paper, we find that network effects play a significant role in the definition of markets for network goods. Our incentivized experiment with young Americans reveals that valuations for other social apps increase more sharply in response to a collective TikTok ban as compared to an individual TikTok deactivation. Conversely, intended substitution patterns toward non-social goods are stronger in the case of an individual TikTok deactivation. Our framework and estimates highlight that individual and collective treatments can

[31]Since we needed to re-contact participants through the Prolific platform, most of those who did not agree to participate simply did not respond to our message; it is therefore possible they did not see the message.

[32]We monitor compliance by tracking screen time on participants' iPhones, although we cannot rule out the possibility that participants accessed TikTok using alternative devices. This potential discrepancy represents a possible difference between our individual and collective treatments, as access from any device was fully restricted only during the TikTok ban. Nevertheless, in both treatments, participants could still theoretically access TikTok on laptops by employing VPNs—a common method for circumventing country-specific online restrictions.

lead to qualitatively different conclusions about which alternative goods are substitutes or complements.

One limitation of our incentivized evidence is that it is unclear how changes in valuations, which capture substitution patterns at the extensive margin (usage vs. no usage), map to changes in substitution patterns that include intensive margin responses (changes in time spent). Another limitation is that our elicitation requires respondents to accurately predict the network effects of collective deactivations. Prior evidence on equilibrium neglect (Dal Bó et al., 2018) suggests that our estimates might give a lower bound of the actual difference in substitution patterns between collective and individual-level deactivations. Lastly, our estimates ignore other general equilibrium responses, such as changes in the advertising side of the market (Donati and Fong, 2025). To address these limitations, future research should estimate time substitution patterns in response to realized collective bans of network goods.

Despite these limitations, our findings carry important implications for antitrust policy regarding network goods. In particular, they suggest that the failure to account for network effects could result in mismeasuring a product's relevant market. For TikTok, accounting for network effects reveals that other social apps are closer substitutes than suggested by fixed-network estimates, making it more likely that they are part of the relevant market. At the same time, our estimates suggest that non-social activities—such as video gaming and meditation—are weaker substitutes for social media, making it less likely that they are part of the relevant market. Thus, network effects may make the market narrower—vis a vis non-social activities—yet broader within the set of social apps.

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# Online Appendix:
# Not for publication

Our supplementary material is structured as follows. Appendix A includes additional tables and figures about the experiment. Appendix B presents the instructions for all experiments described in the paper.

# A Deactivation Experiment: Additional Tables and Figures

## A.1 Continuous WTA Results

**Table A1:** Regression Results: Continuous WTA by Platform

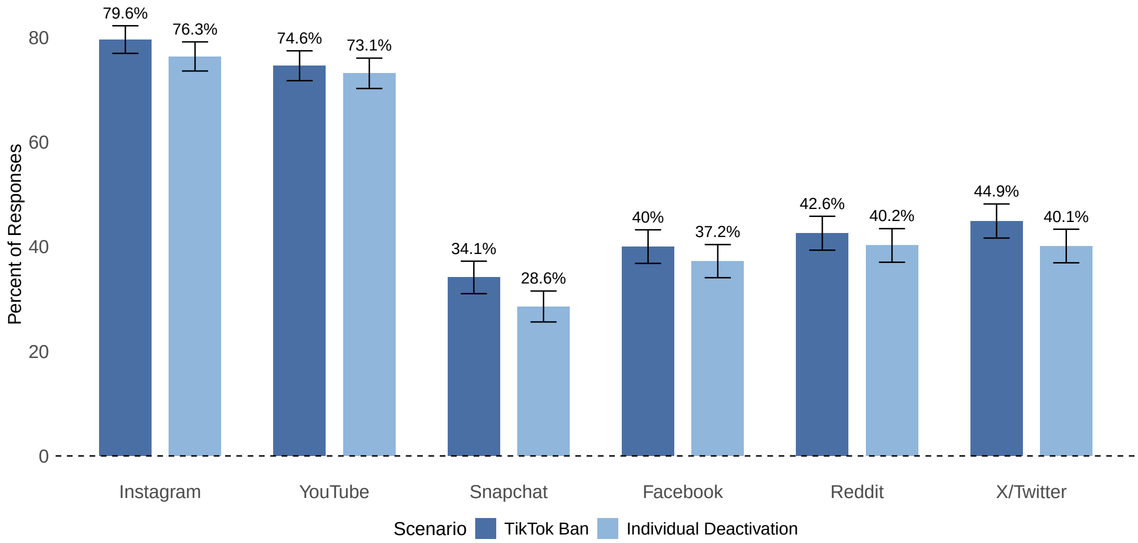
| | **Instagram** | **YouTube** | **Snapchat** |
|---|---|---|---|
| $\Delta_{WTA}$**: TikTok Ban - Individual TikTok Deactivation** | $13.66^{***}$ | $12.10^{***}$ | $7.84^{**}$ |
| | (3.45) | (3.46) | (3.20) |
| $\Delta_{WTA}$**: Individual TikTok Deactivation - No TikTok Ban** | $7.48^{*}$ | $10.59^{***}$ | -0.12 |
| | (3.84) | (3.12) | (3.06) |
| $WTA$**: No TikTok Ban** | $83.37^{***}$ | $84.67^{***}$ | $73.76^{***}$ |
| | (2.06) | (1.92) | (1.41) |
| Observations | 316 | 287 | 297 |
| R-squared | 0.0560 | 0.0726 | 0.0166 |

*Notes:* Table A1 displays the regression results for our pre-registered specification for the continuous WTA measure. WTA: No TikTok Ban represents that average WTA to deactivate the platform when there is no TikTok ban. $\Delta_{WTA}$: Individual TikTok Deactivation - No TikTok Ban is the change in WTA when going from no TikTok ban to individual TikTok deactivation. $\Delta_{WTA}$ TikTok Ban - Individual TikTok Deactivation is the change in WTA when going from individual TikTok deactivation to TikTok ban. These regressions were pre-specified. Robust standard errors are in parentheses. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

## A.2 Additional qualitative evidence

In Appendix Figure A1 below, we present results on how individuals expect to shift toward other social media platforms in response to both a TikTok ban and an individual TikTok deactivation. Our findings indicate that people anticipate significantly greater substitution toward YouTube and Instagram compared to other platforms, such as Snapchat, in both scenarios.

**Figure A1:** Proportion of Respondents Indicating an Increase in Time Spent on a Given Platform Under Individual TikTok Deactivation and TikTok Ban Scenarios

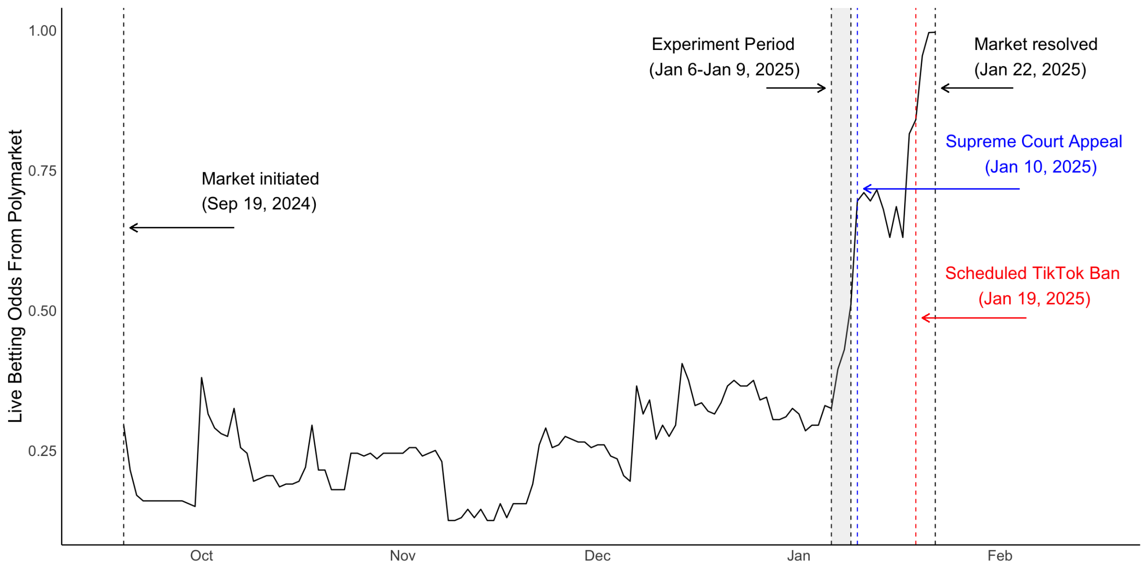



*Notes:* Figure A1 presents the fraction of respondents who expect to increase their usage of various social media platforms following either an individual TikTok deactivation of TikTok (light blue) or a TikTok ban (dark blue), with answers being rated on a 7-point Likert scale ("Strongly decrease", "Decrease", "Slightly decrease", "Not change", "Slightly increase", "Increase", "Strongly increase"). The error bars represent 95% confidence intervals.

## A.3 Polymarket Live Odds

**Online Betting Market Data** We collect data from Polymarket, one of the biggest live online betting markets in the world, which shows the live market-implied probability of the TikTok ban occurring over time. In Figure A2, we display the live odds on Polymarket from September 19, 2024—the date the market was created by platform market makers—through January 22, 2025 when it was resolved following the implementation of the TikTok ban. We implement the "TikTok ban" deactivation scenario for our randomly chosen individuals in the deactivation experiment from Section 3 based on this market resolution. The figure shows that our experiment was conducted during a period of time when the TikTok ban was highly uncertain and the probability of its implementation was volatile. This supports the credibility that both scenarios were taken seriously.

**Figure A2:** Implied Probability of TikTok Ban Implementation Over Time (Polymarket Betting Data)




*Notes:* Figure A2 illustrates the evolution of market expectations regarding the probability of a TikTok ban, based on data extracted from Polymarket from September 19, 2024 when the market was initiated by the platform market makers until January 22, 2025 when the market was resolved after the TikTok Ban was implemented. The vertical dashed blue line marks the Supreme Court appeal hearing on January 10, a day after our data collection ended. The vertical dashed red line marks the implementation of the scheduled TikTok ban on January 19, approximately 10 days after our data collection ended.

## A.4 Robustness

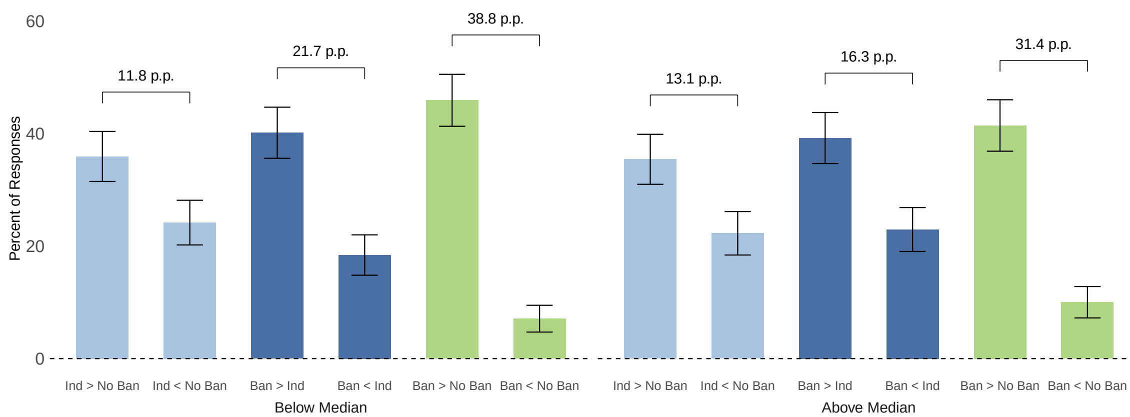
**Perceived Likelihood** In columns 1 and 2 of Table A2 below, we separately present the continuous WTA results for people with above and below median perceived likelihood of the TikTok ban occurring. In columns 3 and 4 we separately present the results for people with above and below median perceived likelihood of the individual TikTok deactivation occurring. We pool across outside options for ease of exposition. We also present these results for the fraction with higher or lower valuations in Figures A3 and A4.

**Table A2:** Continuous WTA by Median Perceived Likelihood Split

| | TikTok Ban | | Individual TikTok Deactivation | |
|---|---|---|---|---|
| | **Below Median** | **Above Median** | **Below Median** | **Above Median** |
| $\Delta_{WTA}$: **TikTok Ban – Individual TikTok Deactivation** | $12.52^{***}$ | $9.95^{***}$ | $10.46^{***}$ | $11.88^{***}$ |
| | (2.94) | (2.55) | (3.16) | (2.42) |
| $\Delta_{WTA}$: **Individual TikTok Deactivation – No TikTok Ban** | $6.76^{**}$ | $5.15^{**}$ | $6.55^{*}$ | $5.48^{***}$ |
| | (3.07) | (2.43) | (3.51) | (2.12) |
| **WTA: No TikTok Ban** | $90.90^{***}$ | $70.11^{***}$ | $93.65^{***}$ | $66.19^{***}$ |
| | (1.58) | (1.41) | (1.71) | (1.18) |
| **Observations** | 454 | 446 | 403 | 497 |
| **R-squared** | 0.0469 | 0.0444 | 0.0348 | 0.0589 |

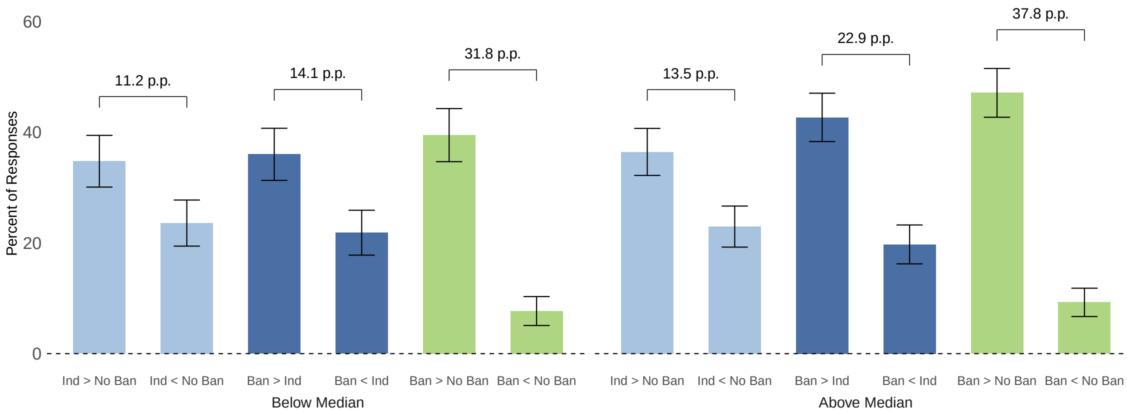
*Notes:* Table A2 displays the regression results for the continuous WTA for participants above and below the median perceived likelihood for both the TikTok ban and the individual TikTok deactivation. We find similar average differences in valuation between the three scenarios for those above or below the median of either perceived likelihood elicitation. Robust standard errors are in parentheses. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

**Figure A3:** Fraction with Higher or Lower Valuation By Median Perceived Likelihood Split of TikTok Ban




*Notes:* Figure A3 illustrates the fraction with higher or lower valuation by scenario for those above and below the median perceived likelihood of the TikTok ban. The light blue bars shows the proportion of individuals who have a higher or lower WTA to deactivate their alternative option platform during individual TikTok deactivation compared to the no TikTok ban scenario. The value above the two bars displays the net fraction with a higher WTA. The dark blue bars present the same proportions when comparing the TikTok ban to individual TikTok deactivation. Similarly, the green bars display the same proportions when comparing the collective TikTok ban compared to the no TikTok ban scenario. The error bars represent 95% confidence intervals.

**Figure A4:** Fraction with Higher or Lower Valuation By Median Perceived Likelihood Split of Individual TikTok Deactivation




*Notes:* Figure A4 illustrates the fraction with higher or lower valuation by scenario for those above and below the median perceived likelihood of the individual TikTok deactivation. The light blue bars shows the proportion of individuals who have a higher or lower WTA to deactivate their alternative option platform during individual TikTok deactivation compared to the no TikTok ban scenario. The value above the two bars displays the net fraction with a higher WTA. The dark blue bars present the same proportions when comparing the TikTok ban to individual TikTok deactivation. Similarly, the green bars display the same proportions when comparing the collective TikTok ban compared to the no TikTok ban scenario. The error bars represent 95% confidence intervals.

**Regret** We allow our respondents to regret their valuations to ensure accurate data quality. After entering their BDM, we ask them if they would agree to participate in the deactivation for their implied valuation. Specifically, we ask whether they agree with the valuation implied by their answer. For example, "You indicated that you would accept $X USD to deactivate your TikTok account for four weeks if TikTok is not banned. Do you agree?". If they disagree, they are redirected to start again and allowed to complete their decision a second time. We asked them if they regret their choice a second time, but everyone proceeds with the next step regardless of their answer. We find that 5.6% of people regret at least one choice in one of the four scenarios they face. In accordance with our pre-registration, we exclude anyone that regrets their choice twice. Our low values of regret are likely helped by including an explanation of the deactivation procedure for Facebook. In Table A3 below, we show that our continuous WTA results are robust to dropping anyone who regrets a choice, even once. In Figure

**Table A3:** Regression Results Without People Who Regret First Valuation: Continuous WTA by Platform

| | **Instagram** | **YouTube** | **Snapchat** |
|---|---|---|---|
| $\Delta_{WTA}$: **TikTok Ban – Individual TikTok Deactivation** | $14.24^{***}$ | $11.77^{***}$ | $9.80^{***}$ |
| | (3.59) | (3.62) | (3.05) |
| $\Delta_{WTA}$: **Individual TikTok Deactivation – No TikTok Ban** | $7.49^{*}$ | $10.70^{***}$ | -2.28 |
| | (4.00) | (3.29) | (2.89) |
| **WTA: No TikTok Ban** | $83.53^{***}$ | $85.60^{***}$ | $75.18^{***}$ |
| | (2.16) | (2.00) | (1.40) |
| Observations | 302 | 271 | 277 |
| R-squared | 0.0573 | 0.0695 | 0.0245 |

*Notes:* Table A3 displays the regression results for our pre-registered specification for the continuous WTA measure but dropping anyone who regrets their first valuation for any scenario. WTA: No TikTok Ban represents that average WTA to deactivate the platform when there is no TikTok ban. $\Delta_{WTA}$: Individual TikTok Deactivation - No TikTok Ban is the change in WTA when going from no TikTok ban to individual TikTok deactivation. $\Delta_{WTA}$: TikTok Ban - Individual TikTok Deactivation is the change in WTA when going from individual TikTok deactivation to TikTok ban. These regressions were pre-specified. Robust standard errors are in parentheses. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

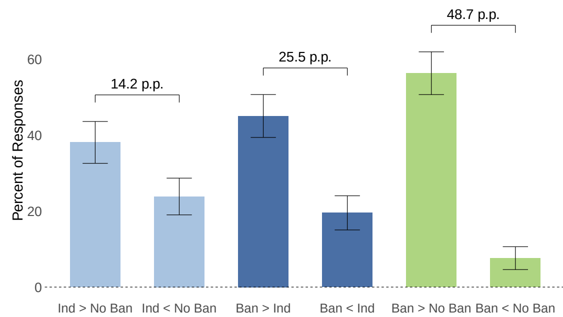
**Table A4:** Continuous WTA Results by Order of Scenario: Instagram

| | **TikTok Ban First** | **Individual First** |
|---|---|---|
| $\Delta_{WTA}$: **TikTok Ban – Individual TikTok Deactivation** | $14.49^{***}$ | $12.71^{**}$ |
| | (4.85) | (4.90) |
| $\Delta_{WTA}$: **Individual TikTok Deactivation – No TikTok Ban** | 9.54 | 5.10 |
| | (6.41) | (3.73) |
| **WTA: No TikTok Ban** | $82.48^{***}$ | $84.39^{***}$ |
| | (3.40) | (2.11) |
| **Observations** | 169 | 147 |
| **R-squared** | 0.0567 | 0.0584 |

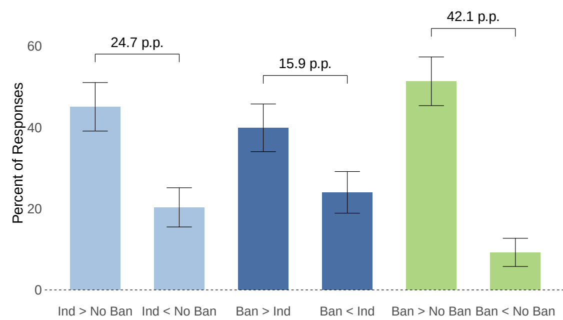
*Notes:* Table A4 displays the regression results for the continuous WTA for Instagram by the order the second and third scenarios were presented in (i.e., either TikTok ban first or individual TikTok deactivation first). WTA: No TikTok Ban represents that average WTA to deactivate the platform when there is no TikTok ban. $\Delta_{WTA}$: Individual TikTok Deactivation - No TikTok Ban is the change in WTA when going from no TikTok ban to individual TikTok deactivation. $\Delta_{WTA}$: TikTok Ban - Individual TikTok Deactivation is the change in WTA when going from individual TikTok deactivation to TikTok ban. Robust standard errors are in parentheses. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

**Figure A5:** Fraction with Higher or Lower Valuation By Scenario Without People Who Regret First Valuation

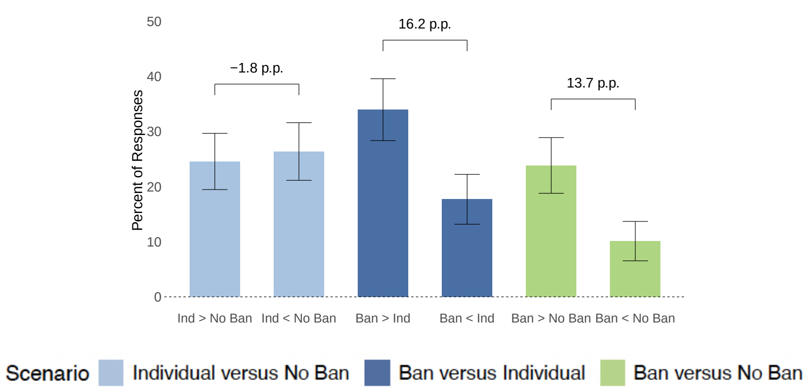
**(a)** Instagram




**(b)** YouTube

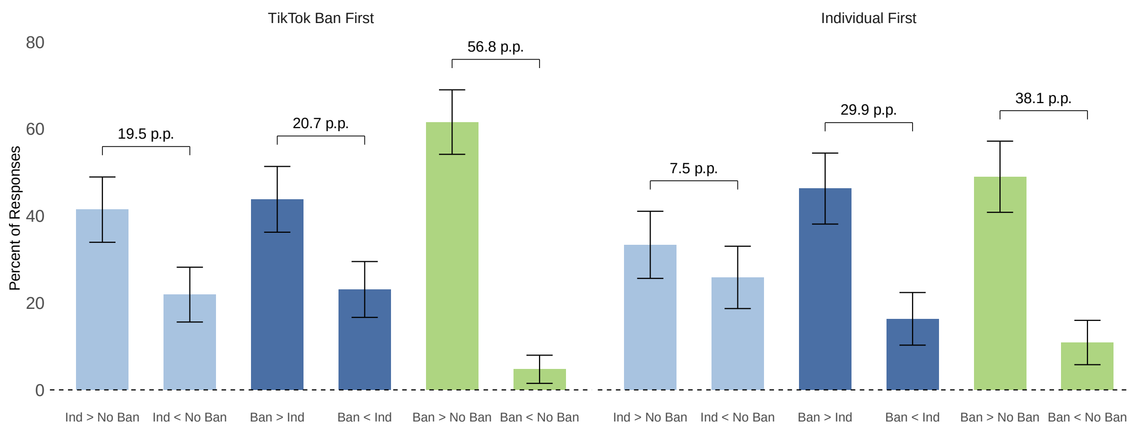



**(c)** Snapchat




*Notes:* By platform and excluding those who regret their first valuation, Figure A5 illustrates differences in the valuation of alternative apps across three scenarios: no TikTok ban, individual TikTok deactivation, and a TikTok ban. Panel a) is for Instagram, b) for YouTube, and c) for Snapchat. For each platform, the light blue bars shows the proportion of individuals who have a higher or lower WTA to deactivate their alternative option platform during individual TikTok deactivation compared to the no TikTok ban scenario. The value above the two bars displays the net fraction with a higher WTA. The dark blue bars present the same proportions when comparing the TikTok ban to individual TikTok deactivation. Similarly, the green bars display the same proportions when comparing the collective TikTok ban compared to the no TikTok ban scenario. The error bars represent 95% confidence intervals.

**Figure A6:** Fraction with Higher or Lower Valuation By Order of Scenario: Instagram



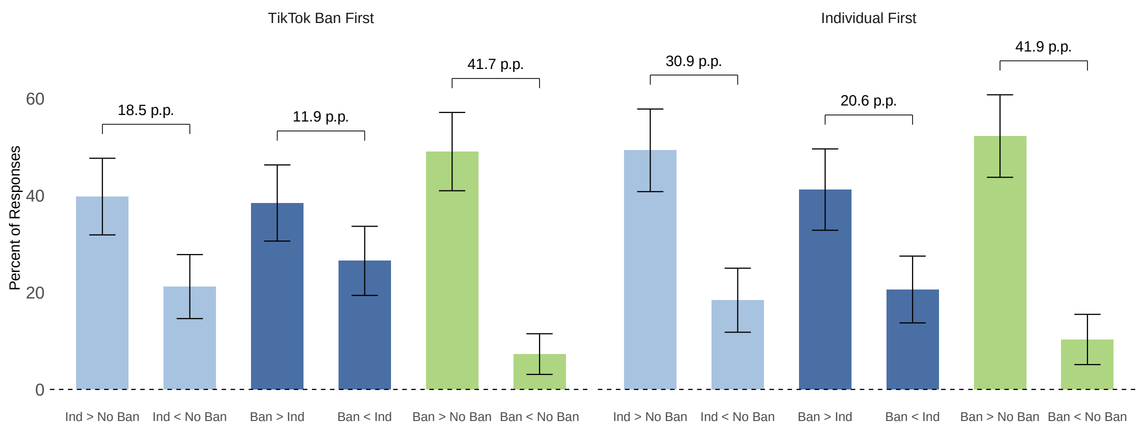

*Notes:* Figure A6 illustrates the fraction with higher or lower valuation by the order the second and third scenarios were presented in (i.e., either TikTok ban first or individual TikTok deactivation first). The light blue bars shows the proportion of individuals who have a higher or lower WTA to deactivate their alternative option platform during individual TikTok deactivation compared to the no TikTok ban scenario. The value above the two bars displays the net fraction with a higher WTA. The dark blue bars present the same proportions when comparing the TikTok ban to individual TikTok deactivation. Similarly, the green bars display the same proportions when comparing the collective TikTok ban compared to the no TikTok ban scenario. The error bars represent 95% confidence intervals.

**Table A5:** Continuous WTA Results by Order of Scenario: YouTube

| | **TikTok Ban First** | **Individual First** |
|---|---|---|
| $\Delta_{WTA}$: **TikTok Ban – Individual TikTok Deactivation** | $12.05^{***}$ | $12.16^{**}$ |
| | (3.97) | (5.85) |
| $\Delta_{WTA}$: **Individual TikTok Deactivation – No TikTok Ban** | $9.19^{**}$ | $12.15^{**}$ |
| | (3.63) | (5.24) |
| **WTA: TikTok Ban** | $78.95^{***}$ | $89.80^{***}$ |
| | (2.02) | (3.34) |
| **Observations** | 151 | 136 |
| **R-squared** | 0.0973 | 0.0603 |

*Notes:* Table A5 displays the regression results for the continuous WTA for YouTube by the order the second and third scenarios were presented in (i.e., either TikTok ban first or individual TikTok deactivation first). WTA: No TikTok Ban represents that average WTA to deactivate the platform when there is no TikTok ban. $\Delta_{WTA}$: Individual TikTok Deactivation - No TikTok Ban is the change in WTA when going from no TikTok ban to individual TikTok deactivation. $\Delta_{WTA}$: TikTok Ban - Individual TikTok Deactivation is the change in WTA when going from individual TikTok deactivation to TikTok ban. Robust standard errors are in parentheses. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

**Figure A7:** Fraction with Higher or Lower Valuation By Order of Scenario: YouTube



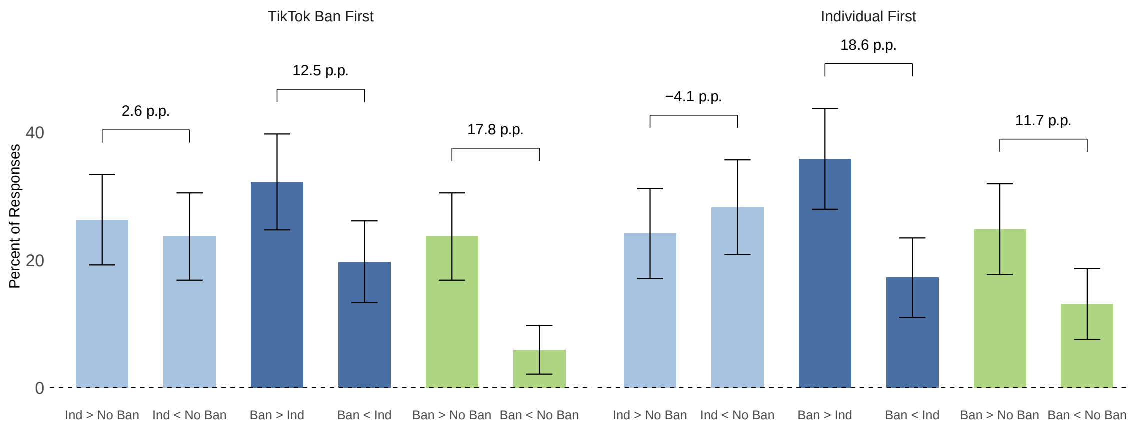

*Notes:* Figure A7 illustrates the fraction with higher or lower valuation by the order the second and third scenarios were presented in (i.e., either TikTok ban first or individual TikTok deactivation first). The light blue bars shows the proportion of individuals who have a higher or lower WTA to deactivate their alternative option platform during individual TikTok deactivation compared to the no TikTok ban scenario. The value above the two bars displays the net fraction with a higher WTA. The dark blue bars present the same proportions when comparing the TikTok ban to individual TikTok deactivation. Similarly, the green bars display the same proportions when comparing the collective TikTok ban compared to the no TikTok ban scenario. The error bars represent 95% confidence intervals.

**Table A6:** Continuous WTA Results by Order of Scenario: Snapchat

| | **TikTok Ban First** | **Individual First** |
|---|---|---|
| $\Delta_{WTA}$**: TikTok Ban – Individual TikTok Deactivation** | 7.35 | $8.35^{**}$ |
| | (5.00) | (3.98) |
| $\Delta_{WTA}$**: Individual TikTok Deactivation – No TikTok Ban** | 1.86 | -2.20 |
| | (4.97) | (3.51) |
| **WTA: TikTok Ban** | $75.42^{***}$ | $72.69^{***}$ |
| | (2.20) | (1.70) |
| **Observations** | 152 | 145 |
| **R-squared** | 0.0156 | 0.0208 |

*Notes:* Table A6 displays the regression results for the continuous WTA for Snapchat by the order the second and third scenarios were presented in (i.e., either TikTok ban first or individual TikTok deactivation first). WTA: No TikTok Ban represents that average WTA to deactivate the platform when there is no TikTok ban. $\Delta_{WTA}$: Individual TikTok Deactivation - No TikTok Ban is the change in WTA when going from no TikTok ban to individual TikTok deactivation. $\Delta_{WTA}$: TikTok Ban - Individual TikTok Deactivation is the change in WTA when going from individual TikTok deactivation to TikTok ban. Robust standard errors are in parentheses. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

**Figure A8:** Fraction with Higher or Lower Valuation By Order of Scenario: Snapchat



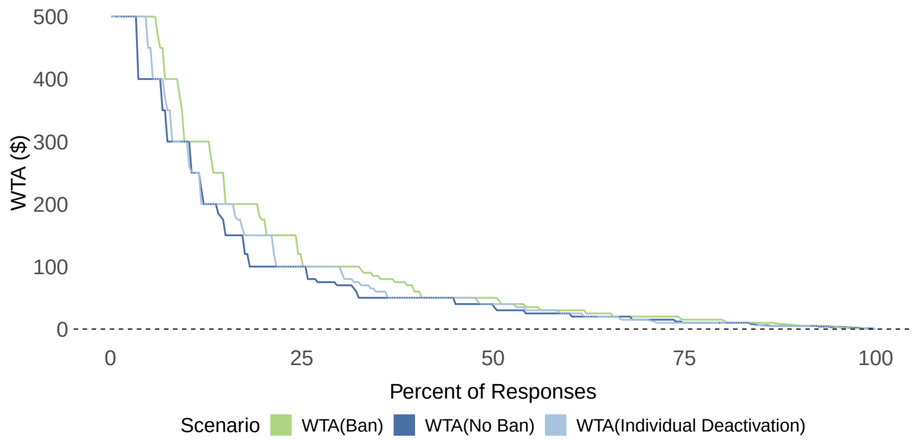

*Notes:* Figure A8 illustrates the fraction with higher or lower valuation by the order the second and third scenarios were presented in (i.e., either TikTok ban first or individual TikTok deactivation first). The light blue bars shows the proportion of individuals who have a higher or lower WTA to deactivate their alternative option platform during individual TikTok deactivation compared to the no TikTok ban scenario. The value above the two bars displays the net fraction with a higher WTA. The dark blue bars present the same proportions when comparing the TikTok ban to individual TikTok deactivation. Similarly, the green bars display the same proportions when comparing the collective TikTok ban compared to the no TikTok ban scenario. The error bars represent 95% confidence intervals.

**Implementation and Compliance** As pre-specified, we selected 1 out of 10 respondents to be in the deactivation study, for a total of 90 participants. We exclude anyone with valuations at the upper bound, as these are not incentive compatible. We then conduct a random computer draw, after which we end up with 55 participants (21 for Snapchat, 15 for YouTube, and 19 for Instagram) that we invite to participate in the deactivation study. We received a response indicating interest in participation from 33 (60%) people. For YouTube and Instagram, 10 people attempted week 1 respectively (implying a 33% and 47% attrition rate). For Snapchat, 13 attempted week 1 successfully (implying a 38% attrition). The deactivation period started on January 20th and ended on February 16th. We find that 76%, or 25 out of 33, of our participants successfully completed the deactivation, for an average payout of $73. Importantly, we don't find differential compliance across platforms: our compliance rates are 70% for YouTube (7 out of 10), 80% for Instagram (8 out of 10) and 77% for Snapchat (10 out of 13).

## A.5 Inverse Demand Functions

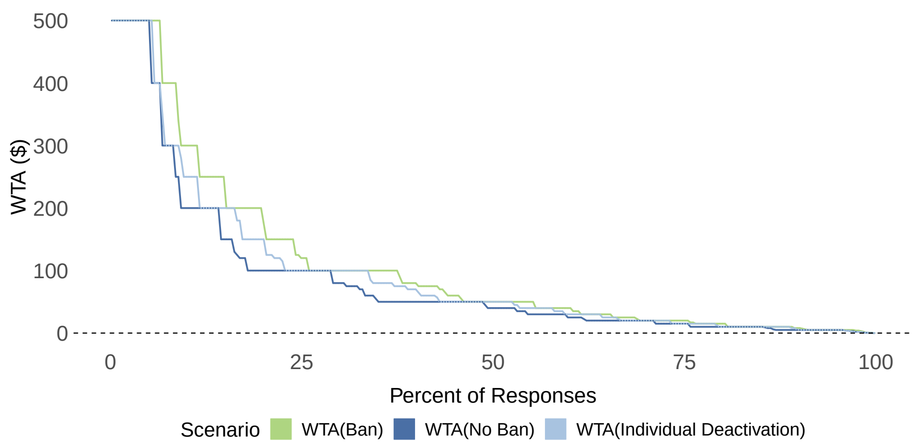
The figures below display the inverse demand functions for all three platforms separately across three scenarios: no TikTok ban, individual TikTok deactivation, and TikTok ban.

**Figure A9:** Inverse Demand Function for Instagram



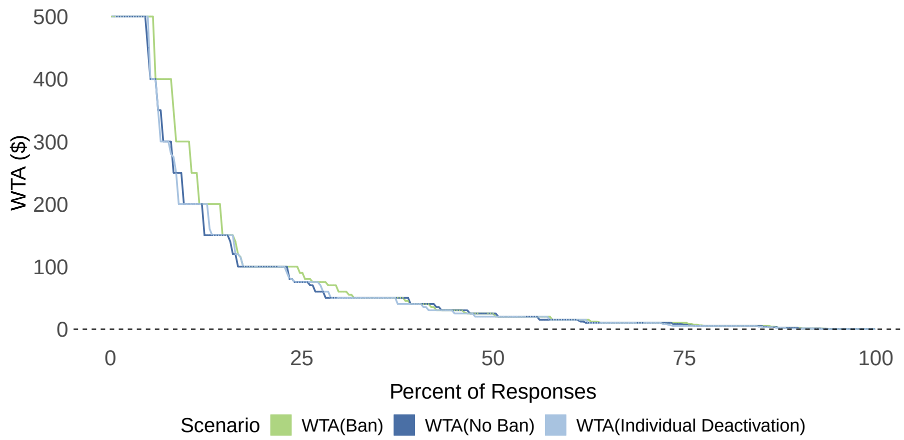

*Notes:* Figure A9 displays the inverse demand curve for respondents' incentivized willingness-to-accept (WTA) for deactivating the Instagram app for four weeks under three scenarios. The green curve shows WTA under the TikTok ban scenario. The dark blue curve shows WTA under the status quo scenario, where no TikTok ban and no individual TikTok deactivation occur. Finally, the light blue curve shows WTA under the individual TikTok deactivation.

**Figure A10:** Inverse Demand Function for YouTube




*Notes:* Figure A10 displays the inverse demand curve for respondents' incentivized willingness-to-accept (WTA) for deactivating the YouTube app for four weeks under three scenarios. The green curve shows WTA under the TikTok ban scenario. The dark blue curve shows WTA under the status quo scenario, where no TikTok ban and no individual TikTok deactivation occur. Finally, the light blue curve shows WTA under the individual TikTok deactivation.

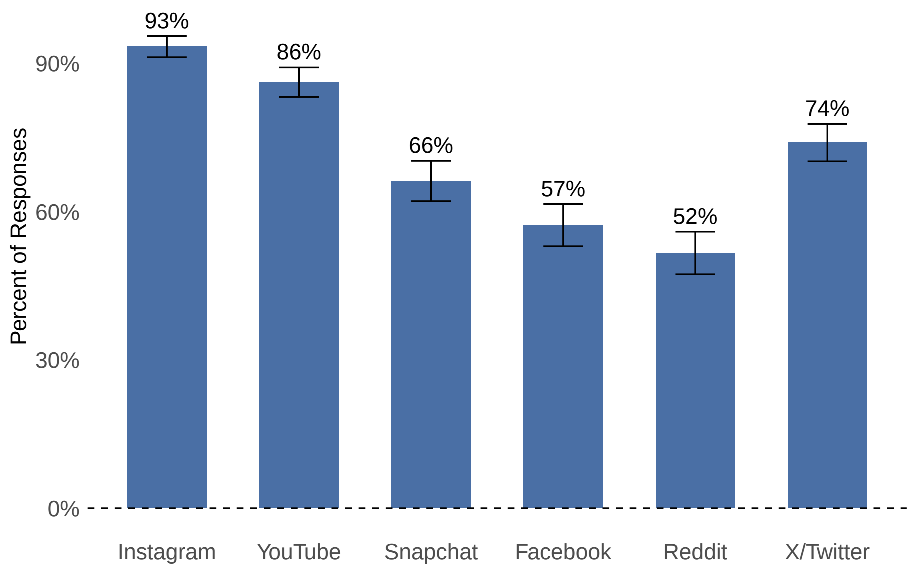
**Figure A11:** Inverse Demand Function for Snapchat




*Notes:* Figure A11 displays the inverse demand curve for respondents' incentivized willingness-to-accept (WTA) for deactivating the Snapchat app for four weeks under three scenarios. The green curve shows WTA under the TikTok ban scenario. The dark blue curve shows WTA under the status quo scenario, where no TikTok ban and no individual TikTok deactivation occur. Finally, the light blue curve shows WTA under the individual TikTok deactivation.

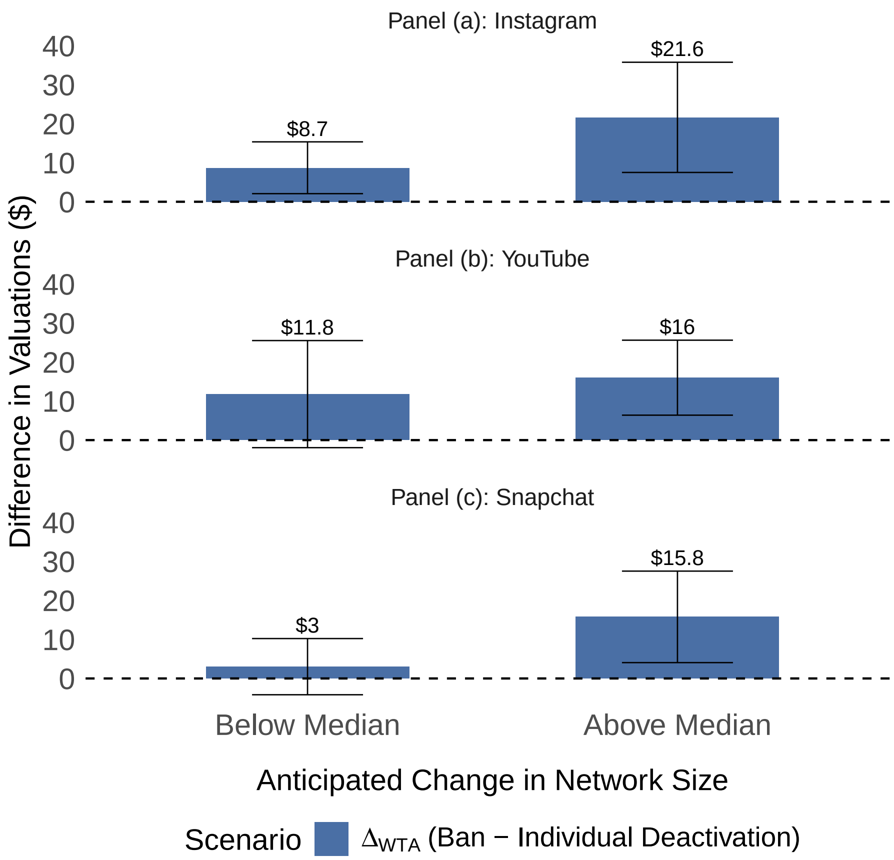
## A.6 Anticipated network effects

**Figure A12:** Share of respondents expecting that their friends will spend more time on this platform if TikTok is banned



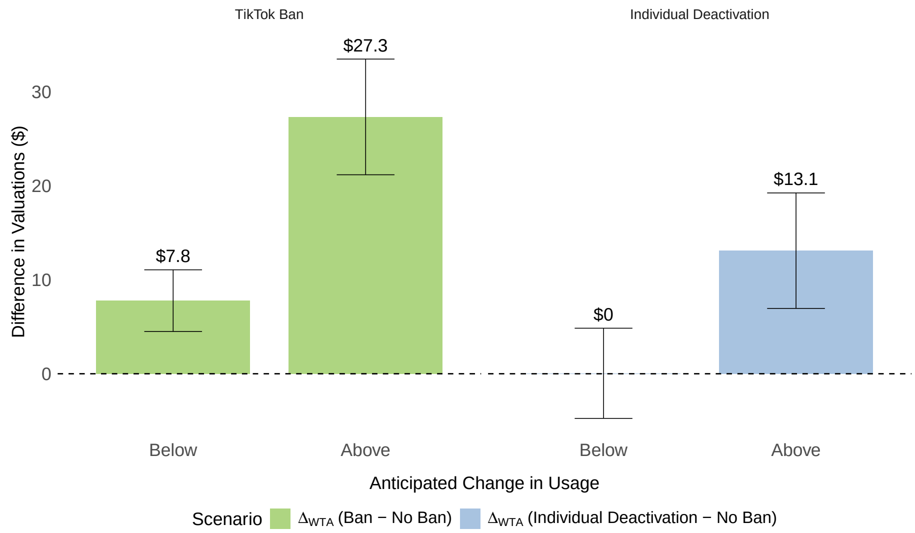

*Notes:* Figure A12 presents the fraction of respondents who expect their friends to increase their usage of various social media platforms following a TikTok ban, with answers being rated on a 7-point likert scale (“Strongly decrease”, “Decrease”, “Slightly decrease”, “Not change”, “Slightly increase”, “Increase”, “Strongly increase”). The error bars represent 95% confidence intervals.

**Figure A13:** Treatment Effect and Anticipated Network Change (Split by Platform)




*Notes:* We ask respondents a question on their anticipated network change: "If the TikTok ban happens for everyone in the U.S., the amount of time I would expect my friends to spend on [platform X]..." with answers being on a 7-point likert scale ("Strongly decrease", "Decrease", "Slightly decrease", "Not change", "Slightly increase", "Increase", "Strongly increase"). The figure displays the average change in WTA between the TikTok ban scenario and the individual TikTok deactivation separately for respondents with below- and above-median anticipated changes in their network size for their assigned platform. Panel (a) shows the difference in valuations for Instagram. Panel (b) shows the same for YouTube, and Panel (c) for Snapchat. The error bars represent 95% confidence intervals.

**Figure A14:** Treatment Effect and Anticipated Substitution Time Change




*Notes:* The figure displays the average change in WTA separately for respondents with below- and above-median anticipated changes in their predicted time use. The error bars represent 95% confidence intervals.

# B Experimental Instructions for TikTok Ban Experiment

In this section, we present the main experimental instructions and decision screens from our deactivation experiment.

What is your age (in years)?

Are you a student?

- ◯ Yes
- ◯ No

Are you an Android or an iPhone user?

- ◯ Android
- ◯ iPhone
- ◯ I don't have a phone

Do you live in the US?

- ◯ Yes
- ◯ No

Which of the following describes you more accurately?

- ◯ Male
- ◯ Female
- ◯ Other / Prefer not to say

**Welcome to our survey!**

This survey aims to understand consumer preferences for phone apps.

Please read the questions and answer them carefully.

We are interested in conducting an experiment where we ask participants to deactivate certain mobile phone apps **for four weeks from January 20th to February 16th, 2025.**

We will compensate individuals for their participation with a monetary payment.

Should participants want to leave the study during the four weeks they can, but they will then forgo any monetary payment. To verify that participants deactivate certain apps on their phone, **we will require them to send us a screenshot of their Screen Time settings once a week.** If a participant fails these checks, they will not receive any monetary payment.

Are you willing to participate in this study?

- ◯ Yes
- ◯ No

This question will be used for a $100 Amazon gift card lottery for correct respondents.

How will we verify that selected users deactivate certain phone apps?

- ◯ By asking them to upload a screenshot of their Screen Time once a week.
- ◯ By periodically sending out a text message once a week.
- ◯ By calling people to ask them.

This question will be used for a $100 Amazon gift card lottery for correct respondents.

For how long will we ask selected users to deactivate certain phone apps?

- ◯ Ten weeks
- ◯ Eight weeks
- ◯ One week
- ◯ Four weeks

Before we continue, we will ask you a series of questions and we will provide you with some information. Please be sure to carefully read through the information, as we might ask you questions about it later.

How frequently did you use each of the following social media platforms in the past month?

| | Not at all | Less than once a week | Once a week | Twice a week | Every day |
|---|---|---|---|---|---|
| Facebook | ◯ | ◯ | ◯ | ◯ | ◯ |
| TikTok | ◯ | ◯ | ◯ | ◯ | ◯ |
| Instagram | ◯ | ◯ | ◯ | ◯ | ◯ |
| YouTube | ◯ | ◯ | ◯ | ◯ | ◯ |
| Snapchat | ◯ | ◯ | ◯ | ◯ | ◯ |
| Twitter/X | ◯ | ◯ | ◯ | ◯ | ◯ |
| Reddit | ◯ | ◯ | ◯ | ◯ | ◯ |

**Proposed TikTok Ban in the US**


Over the past year, U.S. lawmakers and officials have expressed concerns about data privacy and misinformation on TikTok, which is owned by the Chinese company ByteDance.

In April, the U.S. government enacted a law requiring TikTok to be sold to another company or **face a ban** on operating **in the United States**.

The ban is scheduled to take effect on **January 19th, 2025**. However, the Supreme Court has agreed to hear TikTok's appeal on January 10th.

As a result, **it is possible that TikTok will be banned** for all users in the United States on January 19th.

For the following questions, assume that a **TikTok ban** occurs, where **everyone in the US, including you,** is not allowed to use TikTok.

**If the TikTok ban happens** for everyone in the US, the amount of time I would spend on....

| | Scale | | | | | | |
|---|---|---|---|---|---|---|---|
| | Strongly decrease | Decrease | Slightly decrease | Not change | Slightly increase | Increase | Strongly increase |
| Facebook would... | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| YouTube would... | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Snapchat would... | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Reddit would... | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Instagram would... | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| X/Twitter would... | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

For the following questions, assume that **only you have to deactivate TikTok** but everyone else in the US continues using TikTok (i.e., it is not banned).

**If only I would deactivate TikTok** but everyone else continues using it, the amount of time I would spend on....

| | Scale | | | | | | |
|---|---|---|---|---|---|---|---|
| | Strongly decrease | Decrease | Slightly decrease | Not change | Slightly increase | Increase | Strongly increase |
| Instagram would... | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Snapchat would... | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Facebook would... | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| X/Twitter would... | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Reddit would... | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| YouTube would... | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Now, we would like you to compare your expected behavior in two scenarios:

1. The first is when there is a **TikTok ban.**
2. The second is when there is no TikTok ban, but you are **individually asked to deactivate** your **TikTok** account. The rest of the US can continue using TikTok normally.

Under what scenario do you think would you spend more time on **Snapchat?**

- ◯ The same time under both scenarios
- ◯ When only I have to deactivate my TikTok
- ◯ When there is a TikTok ban for everyone

Under what scenario do you think would you spend more time on **YouTube?**

- ◯ The same time under both scenarios
- ◯ When only I have to deactivate my TikTok
- ◯ When there is a TikTok ban for everyone

Under what scenario do you think would you spend more time on **Instagram?**

- ◯ The same time under both scenarios
- ◯ When only I have to deactivate my TikTok
- ◯ When there is a TikTok ban for everyone

Next, you will be asked about your willingness to deactivate different phone apps under possible future scenarios. We will run the deactivation study for 1 in 10 participants.

Before we proceed, we will give you a hypothetical example to explain how we will determine your compensation.

Suppose that we ask you to deactivate your Facebook account for four weeks.

**Here's how it works:**

1. For a possible future scenario, we will ask you to state the **smallest amount of money** you would need to deactivate Facebook for four weeks. We refer to this amount as your valuation below.
2. If the future scenario occurs, then the computer will randomly generate an amount of money to offer you to deactivate Facebook for four weeks.
3. If your valuation is lower than the computer's offer, we will ask you to deactivate Facebook for four weeks and give you the computer's offer.
4. If your valuation is higher than the computer's offer, we will not ask you to deactivate Facebook and you will not receive any payment in that case.

This rule means that the higher the amount you require to deactivate Facebook on your phone, the lower the chance that you will be chosen to be in the study and receive the computer's offer.

To make sure you get the best option for you, it is important to be **truthful** about the **smallest amount of money** you would need to deactivate Facebook.

We will now ask you a comprehension question based on the text above. This question will be used for a $100 Amazon gift card lottery for correct respondents.

For a possible future scenario, which of the following statements is **true** about the minimum amount of money you would require to deactivate Facebook on your phone?

- ○ The minimum amount of money required to deactivate Facebook does not affect the chance that I will be chosen to deactivate Facebook.
- ○ Requiring a higher amount of money to deactivate Facebook makes it more likely that I will be chosen to deactivate Facebook and receive the extra payment.
- ○ Requiring a higher amount of money to deactivate Facebook makes it less likely that I will be chosen to deactivate Facebook and receive the extra payment.

We will now ask you for your valuation to deactivate phone apps under several possible future scenarios.

Recall that it is in your best interest to be **truthful about the minimum compensation** you require to deactivate a given app **in each scenario** we describe.

**Scenario: TikTok is NOT Banned**

Assume that TikTok wins the appeal and remains available to all users in the US after January 19th.

In this scenario, how much would we need to pay you (in US dollars) to deactivate your **TikTok** account for four weeks?

Reminder: Please respond truthfully.

$ [ ]

We will now ask you questions about the amount of money we need to pay you to deactivate **YouTube** under 3 different scenarios.

**Scenario: TikTok is NOT Banned**

Assume that TikTok wins the appeal and remains available to all users in the US after January 19th.

In this scenario, how much would we need to pay you (in US dollars) to deactivate your **YouTube** account for four weeks?

Reminder: Please respond truthfully.

$ [ ]

**Scenario: TikTok is Banned**

Assume that TikTok loses the appeal and is banned in the US on January 19th.

The **TikTok ban** would apply to **everyone in the US, including you.**

In this scenario, how much would we need to pay you (in US dollars) to deactivate your **YouTube** account for four weeks?

Reminder: Please respond truthfully.

$ [    ]

**Scenario: You deactivate TikTok, but it is NOT banned**

Assume that TikTok wins the appeal and remains available to all users in the US after January 19th. This means the **general public** in the US **can continue using TikTok** as usual.

Additionally, assume the random draw exceeds the valuation you provided to deactivate TikTok for four weeks in a previous question, and we ask you to **deactivate your TikTok in exchange for this payment.**

In this scenario, how much **additional** money would we need to pay you (in US dollars) to also deactivate your **YouTube** account for four weeks?

Reminder: Please respond truthfully.

$ [    ]

We will now ask you questions about the amount of money we need to pay you to deactivate **Instagram** under 3 different scenarios.

**Scenario: TikTok is NOT Banned**

Assume that TikTok wins the appeal and remains available to all users in the US after January 19th.

In this scenario, how much would we need to pay you (in US dollars) to deactivate your **Instagram** account for four weeks?

Reminder: Please respond truthfully.

$ [    ]

**Scenario: TikTok is Banned**

Assume that TikTok loses the appeal and is banned in the US on January 19th.

The **TikTok ban** would apply to **everyone in the US, including you.**

In this scenario, how much would we need to pay you (in US dollars) to deactivate your **Instagram** account for four weeks?

Reminder: Please respond truthfully.

$ [ ]

**Scenario: You deactivate TikTok, but it is NOT banned**

Assume that TikTok wins the appeal and remains available to all users in the US after January 19th. This means the **general public** in the US **can continue using TikTok** as usual.

Additionally, assume the random draw exceeds the valuation you provided to deactivate TikTok for four weeks in a previous question, and we ask you to **deactivate your TikTok in exchange for this payment.**

In this scenario, how much **additional** money would we need to pay you (in US dollars) to also deactivate your **Instagram** account for four weeks?

Reminder: Please respond truthfully.

$ [ ]

We will now ask you questions about the amount of money we need to pay you to deactivate **Snapchat** under 3 different scenarios.

**Scenario: TikTok is NOT Banned**

Assume that TikTok wins the appeal and remains available to all users in the US after January 19th.

In this scenario, how much would we need to pay you (in US dollars) to deactivate your **Snapchat** account for four weeks?

Reminder: Please respond truthfully.

$ [ ]

**Scenario: TikTok is Banned**

Assume that TikTok loses the appeal and is banned in the US on January 19th.

The **TikTok ban** would apply to **everyone in the US, including you.**

In this scenario, how much would we need to pay you (in US dollars) to deactivate your **Snapchat** account for four weeks?

Reminder: Please respond truthfully.

$ [ ]

**Scenario: You deactivate TikTok, but it is NOT banned**

Assume that TikTok wins the appeal and remains available to all users in the US after January 19th. This means the **general public** in the US **can continue using TikTok** as usual.

Additionally, assume the random draw exceeds the valuation you provided to deactivate TikTok for four weeks in a previous question, and we ask you to **deactivate your TikTok in exchange for this payment.**

In this scenario, how much **additional** money would we need to pay you (in US dollars) to also deactivate your **Snapchat** account for four weeks?

Reminder: Please respond truthfully.

$ [ ]

How likely do you believe it is that TikTok will lose the US Supreme Court appeal and be banned in the US on January 19th?

very unlikely ... very likely

0 10 20 30 40 50 60 70 80 90 100

Please select a value.

Assume that you are a participant that is chosen to participate in our study. If the TikTok ban does not happen on January 19th, how likely do you believe it is that we ask you to deactivate your TikTok account in exchange for a monetary payment?

very unlikely ... very likely

0 10 20 30 40 50 60 70 80 90 100

Please select a value.

If the TikTok ban happens for everyone in the US, the amount of time I would **expect my friends** to spend on...

| | Strongly decrease | Decrease | Slightly decrease | Not change | Slightly increase | Increase | Strongly increase |
|---|---|---|---|---|---|---|---|
| Instagram would... | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Facebook would... | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| X/Twitter would... | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Reddit would... | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| YouTube would... | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Snapchat would... | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

(Scale)

We would again like you to compare your expected behavior in two scenarios:

1. The first is when there is a **TikTok ban.**
2. The second is when there is no TikTok ban, but you are **individually asked to deactivate** your **TikTok** account. The rest of the US can continue using TikTok normally.

Under what scenario do you think would you spend more time **practicing meditation?**

- ○ The same time under both scenarios
- ○ When only I have to deactivate my TikTok
- ○ When there is a TikTok ban for everyone

Under what scenario do you think would you spend more time **on your laptop?**

- ○ The same time under both scenarios
- ○ When only I have to deactivate my TikTok
- ○ When there is a TikTok ban for everyone

Under what scenario do you think would you spend more time **playing phone games?**

- ◯ The same time under both scenarios
- ◯ When only I have to deactivate my TikTok
- ◯ When there is a TikTok ban for everyone

If you had to guess, how many minutes do you spend on **TikTok** on average every day?

If you had to guess, how many minutes do you spend on **Instagram** on average every day?

If you had to guess, how many minutes do you spend on **YouTube** on average every day?

If you had to guess, how many minutes do you spend on **Snapchat** on average every day?

Some people say they use TikTok too much and ideally would use them less. Other people are happy with their usage or would ideally use them more. How do you feel about the amount of time you spent on TikTok over the past 3 weeks?

- ◯ I spent just the right amount on TikTok
- ◯ I spent too little time on TikTok
- ◯ I spent too much time on TikTok

Relative to your actual use over the past 3 weeks, by how much would you ideally have reduced your time spent on TikTok (in percent)?

0 10 20 30 40 50 60 70 80 90 100

Slide to select percent

Relative to your actual use over the past 3 weeks, by how much would you ideally have increased your time spent on TikTok (in percent)?

0 10 20 30 40 50 60 70 80 90 100

Slide to select percent