MODELING EFFECTIVE REGULATION OF FACEBOOK

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SOCIAL MEDIA PLATFORMS BREAK TRADITIONAL BARRIERS of distance and time between people and present unique challenges in calculating the precise value of the transactions and interactions they enable. In the case of a company like Facebook, each layer of connections creates value and attracts additional users to the platform. The compounding nature of this phenomenon gives platforms significant market power. In the face of growing scrutiny from policymakers, the media, and the public, regulators are now considering a number of proposals to ensure platforms do not abuse their market power or restrict the economic benefits of their networks from being more equitably distributed.

In a new working paper we published entitled "How to Govern Facebook: A Structural Model for Taxing and Regulating Big Tech" we develop the first quantitative framework for regulators and business leaders to evaluate the societal consequences of changes to market structure, taxation, and platform regulation. Our model takes a structural approach to understanding participation in social media platforms that accounts for the wide range of Facebook users and establishes a rigorous methodology for measuring the essential real-world features of users' demand for the platform.

Our structural approach brings new insights to understanding how government interventions could have the unintended effect of exacerbating existing market distortions. Overall, our analysis suggests that policymakers should focus on

KEY TAKEAWAYS

- Our model provides the first quantitative framework to gauge the effect tax policy or regulatory action would have on platform usage, consumer welfare, and Facebook revenues.

- The average Facebook user values their use of the platform at about $79 per month, while the company's own quarterly reports say each user only generates $11.67 per month in ad revenue. Understanding how this relationship reacts to changes in taxation or regulation is the key to understanding what policies will be effective and which will fail.

- Taxing advertising would increase Facebook usage and consumer welfare, while taxing the number of users would do the opposite.

- Policymakers should investigate "data as labor" proposals to compensate consumers for their data. They should also explore measures like mandated interoperability to promote competitiveness without destroying network effects.

redistributive rather than trust-busting tools for dealing with Facebook. A tax on targeted advertisements, or a more ambitious proposal to compensate users for watching ads and providing their data, deserve policymakers' close attention. Policymakers should also investigate measures to encourage greater platform competition by mandating greater interoperability between social media companies. These measures would ensure more gains were passed along to consumers and would also allow Facebook to continue selling advertisements in a manner productive to all parties.

INTRODUCTION

Much of the value of social media businesses like Facebook comes from "network effects"—an element of each user's participation in a platform that one participant provides to another participant, rather than the interactions between the participant and the platform itself. Understanding how network effects create value and pairing that knowledge with survey data from Facebook users allows us to accurately model the cumulative value of the interactions that the company makes possible. In our research, we construct a flexible strategy to measure the economic value ascribed to these user-to-user interactions and point towards the best ways of harnessing them in order to maximize the platform's social value. We then use the model to simulate the effect of several proposed digital platform regulatory actions and tax policies.

Our approach builds on traditional price discrimination models and uses survey responses from over 57,000 internet users (drawn from a representative sample of the U.S. internet population) to estimate their cumulative demand for Facebook. Using a series of take-it-or-leave-it questions like "would you accept $10 to stop using Facebook for one month?" we can determine how users would react to changes in the platform as well as an implied value of the platform that different demographic groups ascribe to the company beyond the advertising services it provides. This allows us to capture a remarkable degree of nuance among the twelve demographic cohorts we surveyed (two genders and six different age ranges).

The median American internet user would be willing to give up Facebook for $18.16 a month

Understanding the diversity of users' desire to continue participating in the network gives us more precise insights into how they will use and value Facebook under different regulatory scenarios. There are more female users of Facebook overall and within each age group and we find that most of the value from connections on Facebook tends to flow from younger and male users towards older and female users. The median American internet user would be willing to give up Facebook for $18.16 a month while the average Facebook user values it at about $79 a month. Quantifying the value of social connections in this way shows us that a small subset of the population values the platform extremely highly while many Americans hardly value it at all. Facebook's own quarterly reports state that each North America user generates $11.67 in advertising revenues per month. This leads us to believe that Facebook wants to maintain a large user base in order to protect its position and develop new products, beyond just maximizing the ad revenue the company generates each month.

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**Policy Brief: Modeling Effective
Regulation of Facebook**

RESEARCH OUTCOMES

Armed with a model specifically calibrated for Facebook, our estimate of the cumulative social enterprise value leads us to a number of striking conclusions. Our ability to measure the distortions caused by Facebook's business practices leads us to argue that usage of the platform should in fact be subsidized, rather than merely provided for "free" without ads. If perfect competition were achievable without any hampering of positive network effects, participation in Facebook would rise and social welfare would grow by about $670 million per month. On the other hand, if Facebook were purely interested in maximizing short-term revenue, the company could raise an additional $2.38 billion per month by putting the squeeze on users who would not hesitate to see more ads or even pay a fee for the privilege of continuing to use the platform. But this strategy would drive away roughly half of its user base—those who would react negatively towards greater attempts to monetize their usage—and would reduce the overall benefit consumers feel they derive from the platform by 42%.

If instead of maximizing the company's revenue a policy of maximizing cumulative social welfare were pursued, the overall social surplus would rise by the equivalent of $1.3 billion per month. But this would eat into the "productive" advertisements the company serves its users and would require subsidizing usage at the same rate at which it currently raises revenues. In the same way that the government subsidizes physical infrastructure, maximizing social welfare would mean operating Facebook at a large loss. These insights are crucial for policymakers to understand as they establish a frame of reference within which different tax and regulatory actions can be compared.

IMPACT OF PROPOSED TAX OR REDISTRIBUTION POLICIES

Changes in Facebook's Monthly Ad Revenue, Tax Revenue, and Contribution to Social Welfare, in millions

■ **Net Ad Revenue**
Currently:
$1,790.8 million

■ **New Tax Revenue**

■ **Social Welfare**
Currently:
$14,010.6 million
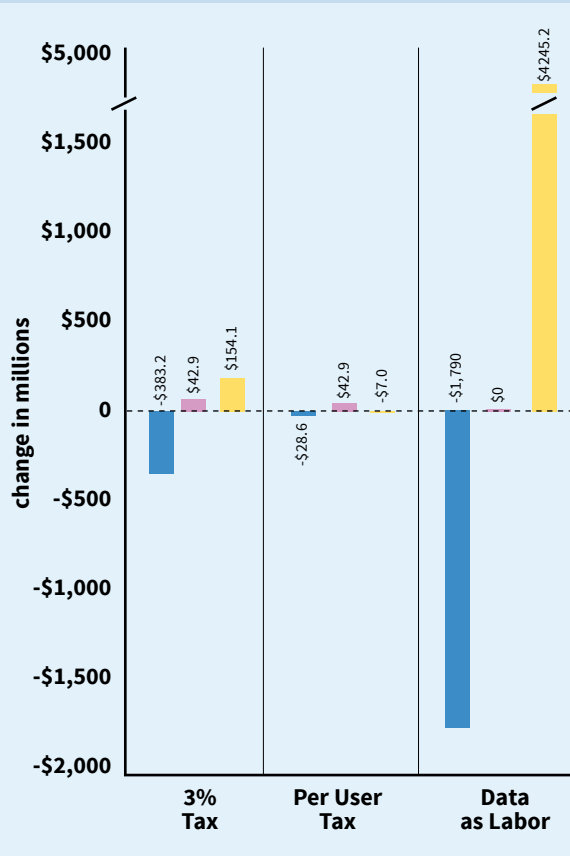
With these three extreme cases in mind, we can evaluate the impact that specific regulatory proposals would have on the cumulative network effects participants ascribe to the platform (i.e. the benefit they gain from using the platform) as well as the cumulative social welfare created by the company. The policy interventions we examine include three taxation proposals and two additional antitrust actions:

the tax proposals include a 3% tax on all advertising revenues, a head tax on each platform user, and a version of a proposal known as "data as labor," which would compensate consumers for viewing targeted ads and sharing their data. The antitrust proposals include a horizontal breakup of the company and a vertical breakup of the company.

POLICY DISCUSSION

A clear sense of what the government's objectives in regulating platform companies will be essential to selecting the most appropriate action. The 3% tax on Facebook's ad-revenues we model here would raise about $515 million a year in tax receipts causing both Facebook participation and the social surplus from Facebook to rise by about 1%. A tax on the number of Facebook users calibrated to raise the same amount of revenue wouldn't just cause the company's post-tax revenue to go down, it would also slightly bring down consumer surplus and usage rates for Facebook. Therefore, unless it is the

> **"Data as labor" would provide a rebate to users for the data they share and the advertisements they view, attracting new users to the platform**

IMPACT OF PROPOSED ANTITRUST INTERVENTIONS

Change in Facebook's Monthly Ad Revenue and Contribution to Social Welfare, in millions

■ **Net Ad Revenue**
Currently: $1,790.8 million

■ **Social Welfare**
Currently: $14,010.6 million

	Net Ad Revenue	Social Welfare
Horizontal Breakup	-$886.4	-$11,867
Vertical Breakup	-$270.4	-$1,415.1
Perfect Competition	-$1,790	$672

government's goal to reduce Facebook usage, a tax on advertising revenues would be superior to a tax on the number of users. Even better than taxing advertising is a proposal we evaluate known as "Data as Labor," which would enable collective bargaining of digital platform users so they might share in the profits their data creates. We simulate a full rebate of all advertising revenues to

users while keeping the level of advertising constant and show that while it would be very negative for Facebook profits, this approach would significantly raise usage and consumer surplus from Facebook. Users would be equitably compensated, they would have a greater voice in how their data is used, network effects would receive a boost from the larger user base, and productive advertisements could be continued with the surplus captured by consumers instead of being eliminated. Data as labor, if implementable, offers the best of all worlds.

When evaluating potential antitrust action, our model suggests there are significant risks to breaking up Facebook into smaller entities: sweeping antitrust action might dramatically erode the value network effects provide to users. An attempt to break up the company horizontally might result in the creation of two Facebook monopolies each serving half the population, which would destroy nearly 85% of Facebook's social surplus. A potential vertical breakup like splitting the core social network from Instagram and Whatsapp might result in a lowering of quality that would also be negative for social welfare if it didn't spur competition. We think a better antitrust approach would be one in which Facebook is required to share posts and other communiques with competitor social networks alongside lowering other barriers to entry. One way to view this "mandated interoperability" would be as taking intangible assets important to Facebook like the news feed or the social graph and putting them partly in the public domain. Such an approach could boost competition without destroying network effects.

As the first quantitative estimates of the effect of different policies on Facebook, our findings should be viewed as a call to action for more research, industry input, and regulatory transparency. Many are worried

Platforms and regulators should be incentivized to release their own usage models and, if necessary, regulators should be given powers to compel the platforms to privately share the data needed to properly calibrate their models

about social media due to concerns only indirectly connected to market power (e.g. the spread of fake news, suppression of innovation, internet addiction, political polarization, and invasion of privacy just to name a few). While our framework is capable of incorporating such negative externalities, these considerations were not directly modeled in our estimates due to lack of data. A regulator with access to Facebook's internal usage metrics would be able to use our framework to simulate policies with much more precision and confidence. Platforms and regulators should thus be incentivized to release their own economic models of usage and social welfare. Real world experiments with mandated data interoperability and data unions should be initiated and if necessary, regulators should be given powers to compel the platforms to privately share the data needed to properly calibrate their models. While much great research on digital platforms has been done, it is time for the regulatory conversation to move beyond qualitative discussion of abstract potential harms to quantitative comparison of potential remedies.

The working paper, *"How to Govern Facebook: A Structural Model for Taxing and Regulating Big Tech,"* can be found here: https://papers.ssrn.com/sol3/Papers.cfm?abstract_id=3619535

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