

Big Data at the Crossroads of Antitrust and Consumer Protection*

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Abstract

The rise of big data in the global economy has led to concerns about antitrust and consumer protection, but policy makers often treat the two areas separately. The separate treatment is justified in classical markets because antitrust tends to focus on firm-to-firm interactions, while consumer protection deals with firm-to-consumer interfaces. The two areas may also be subject to different laws, and any crossovers between the two have tended to be small. However, big data blurs the distinction between the two, causing them to intertwine, complement or even conflict with each other. This paper uses examples to illustrate why that is the case and identifies areas that would benefit from more economic research.

Keywords: Data, digital economy, platforms, regulation, antitrust, consumer protection.

JEL Classifications: L1, L2, D8

1 Introduction

Many countries use two sets of laws to address market failures. One is antitrust laws that aim to promote competition for the benefits of consumers. Typical concerns are price-fixing and other collusive agreements among competitors, mergers and acquisitions that substantially lessen competition, and the abuse of monopoly power. The second set of laws assure the rights of consumers. To do so, agencies target fraudulent sellers, police deceptive information in the marketplace, implement minimum product quality, and watch out for unfair behavior that may harm consumers.

Antitrust and consumer protection are often treated separately. For example, in Canada, antitrust laws are enforced by Competition Bureau Canada while consumer protection is under the authority

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of the Office of Consumer Affairs. In the US, both the Department of Justice and the Federal Trade Commission (FTC) enforce antitrust laws, but consumer protection laws are mainly enforced by the FTC, under a bureau separate from antitrust. For financial products and services, consumer protection is also regulated by the Consumer Financial Protection Bureau (CFPB). In the United Kingdom, antitrust and consumer protection functions used to be distributed between the Competition Commission and the Office for Fair Trading, before the two merged to form the Competition and Market Authority (CMA) in 2014. As of today, CMA still has separate senior directors for antitrust and consumer protection.

These separate treatments are justified in classical markets, because antitrust tends to focus on firm-to-firm interactions, while consumer protection deals with firm-to-consumer interfaces. From an economic perspective, antitrust is designed to address the market failure in market power, and consumer protection is more focused on other market failures such as information asymmetry, negative externalities, and bounded rationality. From a legal perspective, the two areas may be subject to different laws (e.g., the Sherman Act and Clayton Act for antitrust, and Truth in Advertising for consumer protection), and any crossovers between the two have tended to be small.

However, the distinction between antitrust and consumer protection has been blurred by big data, or more precisely, by technological advances that allow one to collect, store, and use high-volume, high-velocity and high-variety data. This occurs for several reasons.

First, data exacerbates the information asymmetry between firms and consumers. Consumers face an information overload in the digital era and constantly seek ways that would help them allocate their scarce attention. In contrast, firms welcome data as an input in their business practices and have strong incentives to collect, use, store, or trade consumer data. They are also more resourceful than individual consumers in developing, innovating, utilizing, and commercializing data-driven infrastructures and technologies, such as artificial intelligence, for purposes that may or may not be aligned with the interests of consumers.

Second, users stand to both benefit and lose from the externalities that are associated with data processing and provision, but the specific pecuniary and non-pecuniary harms and benefits to users vis-à-vis firms' data practices are often difficult to quantify. Many firms in the digital economy are multi-sided platforms that depend on network externalities among users on different sides. Typically, one side is individual consumers, while other sides include entities such as sellers, advertisers, content providers, and other platforms. The multisidedness enables new, direct interactions between firms and

consumers as well as among firms, and these interactions feed back into the platform’s business decisions through real-time data generated in the process. The data can also feed back into the different users on the platform and influence future interactions to the benefit and detriment of the users, including firms and consumers.

Third, the nature of data storage and usage raises new questions about property rights and data ownership, data portability and accessibility, data concentration and security, data-related disclosures and transparency, as well as privacy and the ease of data de-anonymization—questions that are at the crossroads of antitrust and consumer protection because they can lead to harms or benefits for consumers on the one hand and alter market power for firms on the other.

More broadly, all of the classical market failures – asymmetric information, negative externalities, market power, and bounded rationality – are potentially exacerbated or face new complications due to data. For instance, data can make every product a credence good with future uncertainty; firms have incentives to extract value from data, but tend to ignore the negative externalities of data; data could be an essential input that an incumbent platform uses against potential competition; and consumers, facing an expanding overload of information, are likely subject to more bounded rationality.

We argue that antitrust and consumer protection could intertwine, complement or even conflict with each other because of big data. To articulate this point, Section 2 presents several examples that highlight data-driven entwinements between antitrust and consumer protection. In Section 3, we connect those examples to a list of incentives that drive market behavior pertaining to data. In Section 4, we review the ongoing literature as to how data affects the classical market failures. Section 5 concludes with a call for more economic research at the crossroads of antitrust and consumer protection.

2 Examples

Although antitrust and consumer protection agencies often share similar objectives—to maximize consumer surplus or a broader measure of total welfare—the two could interfere with each other (Kovacic and Mariniello, 2016). On data issues, we have seen two tendencies that could aggravate the conflicts between the two. One tendency is that each agency focuses on its own concerns and ignores any unintended consequences its actions could generate for the other. For example, a privacy-focused regulation could undermine a level playing field for competition if it becomes harder for smaller firms to comply with the law (Campbell et al., 2015; Krasteva et al., 2015; Jia et al., 2019; Johnson and Shriver, 2019).

At the same time, an antitrust law that requires elements of data sharing between firms could undermine aspects of data privacy and security that consumers value. Another tendency is to stretch antitrust enforcement for data problems that concern consumer protection and not market power, and vice versa (Tucker and Wellford, 2014). For instance, it is not obvious why breaking up a large, data intensive firm would help if one is mostly concerned that the firm does not tell consumers how it collects and uses their personally identifiable data. Similarly, requiring a platform to be completely transparent about an abusive practice may have little effect in making the practice less abusive. The following examples demonstrate such potential complications, as well as the problem of thinking about data-related market failures solely from the perspective of antitrust or consumer protection.

Example 1 [Search bias]: Consider the conflict a vertically-integrated (e.g., search or e-commerce) platform may face in servicing a consumer. The platform may serve the user with results from the platform’s own offerings that with high likelihood match exactly what the user seeks, or let the user choose from a list of results that include offerings from competing providers (e.g., from specialty platforms that focus on servicing the specific verticals to which the user’s query relates).

On the antitrust side, this is precisely the issue that was brought against Google with respect to the inclusion of its own shopping, mapping, and review services at the top of its search results. The case had mixed outcomes. In the US, the FTC closed the case of Google’s alleged search bias in 2013, arguing that Google introduced the product to “improve the quality of its search results,” not to “exclude actual or potential competitors” (Salinger and Levinson, 2015).¹ In the EU, Google was fined 2.42€ billion in 2017 for “abusing dominance as search engine by giving illegal advantage to own comparison shopping service,”² whereas the UK High Court ruled in favor of Google against Streetmap, arguing that the inclusion of the Google Maps box at the top of search results was “not reasonably likely appreciably to affect competition in the market for online maps” and that the conduct was “objectively justified.”³

On the consumer protection side, the example highlights a tradeoff between vertically-integrated curation and broader choice—a tradeoff that appears in a variety of settings where consumers search, including app stores, e-commerce, and other e-services. Vertically-integrated search results may provide easier access to quality products, which may increase the welfare of a subset of consumers, but may harm other consumers who would benefit from a wider choice set. A consumer protection authority

¹See, e.g., <https://www.nytimes.com/2013/01/04/technology/google-agrees-to-changes-in-search-ending-us-antitrust-inquiry.html>.

²http://europa.eu/rapid/press-release_IP-17-1784_en.htm

³https://www.theguardian.com/technology/2016/feb/12/streetmap-loses-google-anticompetitive-search-abuse-case?CMP=twt_a-technology_b-gdntech

may be unclear with respect to which subset of consumers to protect. On the service provider side, the choice is also unclear. Should the service provider inform consumers that its business choice may help some of them but hurt others? Should it let consumers choose, for instance, which search algorithm is used? Should policy makers mandate which algorithm is used?

Example 2 [Sponsored ads]: Consumers who search for goods and services may prefer options from which to choose, but firms may seek to manipulate those options to influence consumers' decisions. Such firm behavior can have both antitrust and consumer protection implications.

For instance, beginning in 2004, contact lens retailer 1-800 Contacts entered into agreements with rivals that suppressed competition in online search advertising, arguably limiting the choices and information provided to consumers who searched for related trademarked keywords. The FTC ruled against this practice on the antitrust side,⁴ stating that “as this agency has explained time and again, robust, accurate, and intelligible price competition among those who compete for consumers' dollars is one of the cornerstones of our vibrant market economy,” and that “when information is withheld from consumers, it frustrates their ability to compare the prices and offerings of competitors” such that “ultimately, the effect of the advertising restrictions is to make information enabling consumer comparisons more difficult and costly to obtain.”⁵

The sort of firm behavior that aims to influence consumers' choice sets can also manifest in the context of consumer protection. For instance, the firm Reservation Counter submitted multiple separate bids for the search keywords of specific hotel names (e.g., “Hilton Birmingham Alabama”), with the end result that the firm had multiple search ads prominently displayed for users who specifically searched for those local hotels. On the consumer protection side, the FTC settled a complaint against Reservation Counter, in which it alleged that the firm specifically crafted their ads to appear as if the consumers who clicked on them were reserving rooms directly from the hotels rather than from the firm.⁶

These two cases suggest that the number and content of sponsored ads could trigger multiple interpretations from the lens of consumer welfare: on the one hand, more alternatives expand the choice set of fully attentive consumers; on the other hand, more (and a certain presentation of) choices could add cognitive loads to consumers and affect their abilities to make fully informed choices. It is also noteworthy that a consumer's choice set is determined not only by advertisers but also by the

⁴<https://www.ftc.gov/enforcement/cases-proceedings/141-0200/1-800-contacts-inc-matter>

⁵https://www.ftc.gov/system/files/documents/cases/docket_no_9372_opinion_of_the_commission_redacted_public_version.pdf

⁶<https://www.ftc.gov/enforcement/cases-proceedings/152-3219/reservation-counter-llc>.

platforms that host and are used to browse the sponsored ads.⁷ The antitrust and consumer protection perspectives on this topic could be conflicting or complementary, depending on how one perceives the incentive and information differences among consumers, advertisers and the hosting platform.

Example 3 [Opt-in consent]: Consumers may not recognize the extent to which using a product or service can result in the outflow of their data, but informing consumers may require that they are inundated with complex data disclosures and consent forms. Such disclosure is burdensome to consumers, despite efforts towards unification, simplification and standardization.⁸

On the consumer protection side, the FTC settled complaints with Apple in 2014,⁹ alleging Apple failed to tell parents that entering a password for a single in-app purchase also approves 15 minutes of additional unlimited purchases their children could make without further action by the parent. FTC Commissioners expressed different opinions about how this practice affects consumer welfare.¹⁰

Let us assume that a subset of consumers prefers simple, one-time consent and disclosure without repeated future consent requests, whereas another subset prefers repeated requests for consent, especially when new payments or data permissions are involved. If firms compete to satisfy the first subset that prefer a one-and-done consent approach,¹¹ should policy makers encourage such competition? On the one hand, a consumer protection fine on one firm that abuses the one-and-done consent approach could give a rival firm a competitive advantage over the first subset of consumers; on the other hand, a universal consumer protection constraint against the one-and-done consent practice could reduce the consumer surplus of this first subset of consumers.¹² Similar to Examples 1 and 2, opt-in consent presents another challenge that intertwines antitrust and consumer protection.

⁷Search engines and web browsers could honor or block ads with ad-blocking extensions; see <https://beincrypto.com/google-strangling-chrome-ad-blocking/> for an example and https://en.wikipedia.org/wiki/Do_Not_Track_legislation for the history of Do Not Track Legislation.

⁸For example, the General Data Protection Regulation, which aims to unify and standardize data regulation across the European Union, mandates that the request for consent must be given in an intelligible and easily accessible form with the purpose for data processing attached to that consent. However, research has shown that privacy policies are rarely read by consumers before they give their consent (Cranor and McDonald, 2008; Strahilevitz and Kugler, 2016) and/or can be designed by firms to be rarely read and yield the desired responses from consumers (Tasi et al., 2010; Athey et al., 2017). Firms may also outright mislead consumers: <https://adexchanger.com/privacy/one-year-into-gdpr-most-apps-still-harvest-data-without-permission/>.

⁹<https://www.ftc.gov/news-events/press-releases/2014/01/apple-inc-will-provide-full-consumer-refunds-least-325-million>

¹⁰See <https://www.ftc.gov/sites/default/files/documents/cases/140115applestatementramirezbrill.pdf> for the joint statement supporting the settlement from Chairwoman Edith Ramirez and Commissioner Julie Brill, see <https://www.ftc.gov/sites/default/files/documents/cases/140115applestatementohlhausen.pdf> for a separate statement of Commissioner Maureen Ohlhausen who voted to accept the settlement, and https://www.ftc.gov/sites/default/files/documents/cases/140115applestatementwright_0.pdf for a dissent from Commissioner Joshua D. Wright.

¹¹See, for instance, <https://techcrunch.com/2019/06/03/apple-is-now-the-privacy-as-a-service-company/>.

¹²See, for instance, <https://techcrunch.com/2019/06/03/apple-kid-apps-trackers/>.

Example 4 [Hidden fees]: Presenting consumers with a set of choices can incentivize firms to influence that set of choices, up to the extent that doing so is not contested by competition or enforcement. So far, we have shown examples of such influence in the form of vertical integration, anticompetitive agreements, and choice manipulation. However, competition itself can drive goods and services providers to compete aggressively on one attribute (e.g., the listing price that is primarily used to sort choices for the consumer), while obfuscating consumers in another dimension (e.g., hidden fees or shrouded attributes). Examples include event booking platforms (ticket booking service and processing fees), hotels (resort fees), banks (account maintenance and minimum balance fees), mobile carrier fees (universal service fund and regulatory charges), and airlines (boarding pass printing fees).¹³ Competition can also drive firms to compete efficiently on one attribute (e.g., price), while inefficiently competing on another (e.g., data collection), even when consumers are informed (Burke et al., 2012).

From the consumer protection angle, some of these practices have been challenged by regulatory bodies—in the US, wireless service providers voluntarily agreed in 2011 to alert consumers ahead of fee increases in cellphone roaming fees;¹⁴ in the EU, cellphone roaming fees were scrapped in 2017 in 28 member states;¹⁵ in the UK, however, the Supreme Court in 2009 overturned earlier court decisions that allowed the Office of Fair Trading to investigate bank overdraft charges.¹⁶ From the antitrust angle, consumers are clearly sensitive to price changes when they price shop, but are less sensitive to add-on fees in other phases of their search or purchasing processes.¹⁷ Competition can worsen the problem, and place more transparent firms in a competitive disadvantage. Should competition be blamed for such firm practices or should the blame be placed on policy makers, platforms or consumers?

Example 5 [Data as a barrier to entry]: Consider a common online firm-to-consumer interface. It may involve personal data that is arguably owned by the user (e.g., photos, videos, a resume), data that is owned by the firm (e.g., marketing analytics, user retention and engagement), and data that is arguably jointly owned by the user and firm (e.g., the predicted locations of the user during each hour of the day, the user’s predicted sleep patterns, and the user’s productivity and ability to effectively multitask¹⁸). Questions regarding market power in a proposed merger of the firm could trigger consumer

¹³Examples are numerous and include, for instance, <https://money.usnews.com/banking/articles/pesky-bank-fees-and-how-to-avoid-them>, <https://www.forbes.com/sites/forbesfinancecouncil/2017/06/20/what-are-all-those-hidden-fees-on-your-cell-phone-bill/>, and <https://www.usatoday.com/story/travel/columnist/mcgee/2018/01/10/plea-transparency-airline-fees/1018803001/>.

¹⁴<https://www.fcc.gov/general/bill-shock-wireless-usage-alerts-consumers>

¹⁵<https://www.wired.co.uk/article/european-union-mobile-roaming-charges>

¹⁶<http://news.bbc.co.uk/2/hi/business/8376906.stm>

¹⁷Sullivan (2017) discusses the issue in the context of hotel resort fees.

¹⁸DeVaro et al. (2018), for example, assess user productivity in an online question and answer forum.

protection considerations (e.g., can “jointly-owned” data be sold to advertisers and insurance firms?); analogously, any consumer protection policies may potentially affect market concentration (e.g., will privacy regulation drive users to use a single service?). If data is a currency and a business asset in the digital era, then a concentration of data has concurrent, potentially conflicting consumer protection and antitrust implications. Among them, data concentration may be a precursor to product, security and infrastructure innovation, which can enhance consumer surplus, as well as a conduit to entrenching and facilitating market power.

From the antitrust angle, worried about data as an impediment to competition, both when shared and when not shared, the European Commission confirmed in 2017 “unannounced inspections in a few Member States concerning online access to bank account information by competing service providers.”¹⁹ In another case, the German Federal Cartel Office (FCO), in conjunction with its complaints against Facebook,²⁰ argued: “As a dominant company Facebook is subject to special obligations under competition law. In the operation of its business model the company must take into account that Facebook users practically cannot switch to other social networks.”²¹ The FCO has published a series of works on “Competition and Consumer Protection in the Digital Economy” with the first one on “Big Data and Competition.”²² Nascent related efforts in the EU have been recently put forth with respect to data and autonomous driving.²³ One emergent question appears to be: If data can be a barrier to entry, should its sharing among competitors be encouraged? From the consumer protection angle, data sharing among firms, particularly in the EU, may go against aspects (or at least the spirit) of the General Data Protection Regulation (GDPR). At the same time, GDPR itself may provide vertically-integrated platforms with the requisite justifications to prioritize their own products, as in Example 1.²⁴

Examples 1-5 are summarized in Table 1 below, specifying the acting regulatory agency under antitrust or consumer protection in each case, the harms the agency aims to address, and the potential spillovers on its counterpart in italicized font. The examples illustrate why competition, including firm-to-firm, firm-to-platform and platform-to-platform competition, can no longer be clearly separated from consumer-to-firm interactions, highlighting the potential for data and any remedial policies to

¹⁹http://europa.eu/rapid/press-release_MEMO-17-3761_en.htm

²⁰<https://newsroom.fb.com/news/2019/02/bundeskartellamt-order/>

²¹https://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2019/07_02_2019_Facebook.html

²²https://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2017/06_10_2017_Schriftenreihe%20Digitales.html

²³https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2018-5349236_en

²⁴See, for instance, <https://www.marketwatch.com/story/google-ranks-as-early-winner-from-gdpr-europes-new-data-privacy-law-2018-05-31>.

Table 1: Summary of Examples 1-5

Example	Practice In Question	Antitrust (AT)	Consumer Protection (CP)
#1 Search Bias	Prioritize own search results	FTC, EC, UK AT Harm: Direct consumers away from competing choices	<i>AT Spillover: Hurt a subset of consumers, help others</i>
#2 Sponsored Ads	Reduce # of ads (part i) and use misleading ads (part ii)	FTC (ad collusion) AT Harm (p. i): Reduce # of bidders in sponsored ads <i>CP Spillover: Hurt competition in sponsored ads</i>	FTC (misleading ads) CP Harm (p. ii): Confuse some consumers <i>AT Spillover: Confuse some consumers due to IP dispute</i>
#3 Opt-In Consent	Not require opt-in consent	<i>CP Spillover: Give incumbents competitive advantage or hurt complying firms in competition</i>	EC (GDPR), FTC (in-app) CP Harm: Violate privacy and consent preferences of some consumers
#4 Hidden Fees	Fail to disclose all fees upfront	<i>CP Spillover: Hurt transparent firms in competition</i>	UK Supreme Court CP Harm: Some consumers surprised by hidden fees
#5 Data As A Barrier	Lack of data portability	German FCO AT Harm: Unmatched data collection deterring entry	<i>AT Spillover: Violate data privacy principles</i>

aggravate the classical market failures. Policy debates about digital markets, which tend to focus on either antitrust or consumer protection, thus miss important interactions between the two.

Economists could and should play a vital role in integrating them, and to some extent recent studies have already begun paving this path but questions remain. For example, should platforms receive distinct regulatory attention in either antitrust or consumer protection? Should this attention vary based on whether a firm is a platform and the size of the platform? How would firms and the broader market react to such regulatory changes? What is the overall objective function? How should one go about determining whether the spillovers between antitrust and consumer protection are in conflict or complementary? Can those spillovers be quantified and better coordinated (e.g., by examining the impact of historical decisions and by simulating the impact of ongoing and counterfactual decisions)?

Any attempt to answer such questions should first seek to understand in what ways platforms are similar to or different from other firms as far as data is concerned, whether these features are necessarily detrimental to welfare, and how the baseline incentives of platforms are shaped.

3 Incentives

The key question that policy makers face is: *What set of data rules maximize welfare?* This question encompasses rules governing who should have access to what data under what circumstances at what time, who can take which actions for how long with the accessible data, and how to incentivize, enforce and adjust these data rules over time.

The European Union’s approach under GDPR is to grant data governance authority primarily to consumers, and let them decide who should access, use and delete their personal data. However, consumers may not be the best party for this task, given their lack of information, bounded rationality, and the tendency to focus on their own data dilemmas without internalizing information externalities. On the other hand, explicitly granting data governance authority to firms and platforms—‘letting the market govern itself’—is subject to the traditional concerns of market power, asymmetric information, externalities, and other market failures. Antitrust and consumer protection laws are supposed to facilitate guardrails against these market failures. If firms and platforms drive data practices, it is necessary to gain clarity about their incentives for collecting and using data.

Below, we highlight incentives that we group as follows: (1) social planner vs. platform planner, (2) firms vs. platforms, and (3) the role of consumers. The interplay of these incentives has market consequences, which are discussed at the end of this section.

3.1 Social planner vs. platform planner

Each platform is an ecosystem in which the platform’s incentives differ from its users’ incentives. Likewise, each platform is a ‘user’ of the broader ‘market’ and its incentives may differ from those of a social planner. Just as a social planner may seek to set data rules for every ‘market’ user, each platform seeks to set policies and data rules for its own users, on all platform sides (Parker et al., 2016). Ideally, the two sets of data policies should be consistent, if not identical. But depending on market conditions and competitive landscapes, a platform’s chosen rules may or may not align with those of a social planner. We summarize this in Incentive 1:

Incentive 1 [Platform as a Planner]: A platform is a planner that sets platform policies and data rules for all (potential) users on the platform, but it does not incorporate users outside the platform.

Traditional platforms such as farmers markets, payment networks, newspapers, and shopping malls have all dealt with analogous issues. To the extent that digital platforms benefit from greater economies of scale, they internalize externalities among more firms and more users than traditional platforms. Since a social planner internalizes the externalities of all market participants, digital platforms are likely to get closer to the social planner’s solution than traditional platforms. For instance, a platform may encourage competition among its sellers, but some individual sellers may not want consumers to know that they charge higher prices than the seller “next door” on the same platform, or even that there are other sellers for the same offerings, as in Example 2. A platform may facilitate the rating and ranking of products for consumers, but some individual sellers may not want consumers to know their products are inferior. A platform could similarly make product and price search easier for consumers based on all sellers’ product and price data, but each seller may seek to limit access to its price data (by both consumers and competitors). These incentives of the platform, of facilitating competition within its domain, should be consistent with the social planner, to the extent that both attempt to incorporate consumer welfare in their objective functions.

The social planner may worry that data-intensified competition within the platform’s domain could hurt seller innovation, but the same worry holds for the platform as well, provided the platform has the same long-run horizon as the social planner and competitive pressure does not drive it to behave differently. At the same time, if the social planner believes that data-intensified competition should be encouraged only up to some level, one has to ask whether the platform will have the incentive to choose the same level. If the answer is yes, the social planner and the platform are aligned. If the answer is no, it would be necessary to determine whether the platform will bias the degree of data-intensified competition up or down, and whether the direction of such bias is industry or sector specific.

On the broader market level, an incumbent platform may also use its market power in ways that are anticompetitive as alleged in Example 1.²⁵ For instance, the platform could force every seller to grant exclusivity, making it more difficult for an entrant platform to compete. The incumbent platform does not internalize the potential negative externality it generates for the market, but the social planner does. Under the logic of typical antitrust concerns regarding abusive market practices, the social planner

²⁵See Biglaiser et al. (2019) for a recent review of incumbency advantage and Katz (2019) for potential anticompetitive behaviors of multisided platforms.

would need to address the anticompetitive aspect of such behavior. In a similar vein, an incumbent platform could retain and not share any data resulting from firms' interactions with consumers through its services. If the incumbent's data enables increasing returns to scale and similar data cannot be accessed elsewhere, then an entrant platform may face difficulty attracting those same firms even if the new platform provides better service and lower prices. Whether this matter also falls under the typical antitrust concern of abusive market practices, and if so to what extent and with what implications (e.g., Example 5), is still an open question.

3.2 Firms vs. platforms

Firms have potentially different data incentives from the platform on which they operate. For a platform, its data incentives are determined by the benefits from data ownership and the cost of data collection, which can be summarized as:

Incentive 2 [Platform Data]: To the extent that data can help a platform to further reduce transaction costs for users on one or more of its sides, the platform will have incentives to collect, secure and use such data.

This incentive highlights an important tradeoff at the platform level: Data may provide an incumbent platform with an advantage if the data is an essential input for achieving scale economies, but making the incumbent share the data (its interface, benefits or utilization) with competing platforms could dampen the incentives for collecting the data in the first place, and may reduce the incentives for investing in data-related platform innovations and synergies as seen in Example 1. Note that a similar dynamic also applies to the platforms that expect to receive data from others. If a policy makes it easier to get data through sharing, then the incentives to invest in data collection, data cleaning or data improvement may decline, essentially creating an incentive to free ride on others' data collection.

Interestingly, the same tradeoff exists for a firm that indirectly interacts with consumers through a platform. For example, the platform may use the firm's data interactions to identify successful new features and integrate those features into its firm-side offerings (e.g., developer libraries). As a result, competing firms can use the platform's offerings to implement the same features, thus reducing the rents of the original firm whose products may have generated the data about such features in the first place. This gives rise to a parallel data incentive for firms:

Incentive 3 [Firm Data]: A firm may seek to capture the data from its interactions with customers

because the data can enable it to meet consumer demand, to innovate, and to collect rents. Having such data available to another firm or to the platform will, on the one hand, reduce the market power generated by the firm having sole access to the data, while on the other hand distort its incentives to collect and use the data in the first place.

Incentives 2 and 3 highlight the same tradeoff but for different subjects. Incentive 2 presents a tradeoff concerning a platform collecting and sharing its data. Incentive 3, in contrast, presents a tradeoff concerning firm-specific data in firm-platform-consumer and firm-platform-firm interactions. It is potentially contradictory to conclude that for Incentive 2 there should be a regulatory push for platform-to-platform and platform-to-firm data sharing because the pro-competitive effects of data sharing (effect A) dominate the incentives to collect and innovate from proprietary data (effect B); but for Incentive 3 there should be a push for intellectual property rights governing the data interactions of an individual firm with its customers through the platform because effect B dominates effect A.

That is, if it is believed that benefits of data sharing (effect A) broadly dominates incentives to invest in data (effect B), one should encourage data sharing at both the platform and firm levels; analogously, if it is believed that effect B broadly dominates A, one should protect data investment at both levels, i.e. allow the platform to have sole access to the aggregate data generated on the platform and allow each firm to have sole access to the firm-specific data interactions conducted through the platform. If a policy maker argues that platforms are a distinct class and therefore effect A should apply to platforms but effect B should apply to non-platform firms, then this disparity in policy needs to be shown to be welfare enhancing, taking into account any potential market distortions (e.g., at the intensive margin, to the behavior of platforms, and at the extensive margin, to the incentives of firms to become platforms).

The above two incentives have a concrete application in data compatibility. In markets with network effects, both firms and platforms have incentives to build *incompatibility* into their offerings in order to fend off competition, raise switching costs, and prevent data from their own interactions with consumers getting into the hands of other firms/platforms. Policy makers have mandated compatibility in some markets, including mobile roaming and phone number portability. One can envision an analogous approach concerning ‘data compatibility.’ However, again, there will be a tradeoff between one entity’s data interactions being available to other parties, thus encouraging competition, and data-sharing dampening the incentives for collecting, processing and improving the data. Again, this tradeoff exists at both the platform level and the firm level, and needs to be dealt with coherently.

Furthermore, there is a danger that data sharing may facilitate anticompetitive behaviors or under-

mine consumers. For instance, in Example 2, information sharing between firms that bid for sponsored ads in a search engine could facilitate collusive agreements, or make them look confusingly similar in the eyes of consumers. In Example 5, data sharing could lower the barrier to entry if data is an important asset for potential entrants, but it may also raise the risk of data breaches and data misuses. From a social planner’s perspective, the benefits of data sharing (facilitating competition, lowering barriers to entry) must be weighed against the costs of data sharing (potential collusion, lesser incentives to collect, clean, secure and improve the data), at both the platform and firm levels.

3.3 The consumer’s role in the data-driven economy

For firms and platforms, their ability to collect data depends on consumer willingness to provide the data, and their benefits from the data depend on the end users’ willingness to use the data. In this sense, consumers are data providers and data consumers at the same time.

On the consumption end, consumers face serious information overload, in terms of too many products and seller options to choose from, too many disclosures and fine prints to read, and too much content to consume. The overload may further drive consumers to seek tailored curation of information from fewer and fewer destinations. We can summarize this incentive as:

Incentive 4: [Information Overload]: Information overload may drive consumers to consolidate their interactions with fewer firms and platforms.

The information overload, combined with the technology that enables the collection of high-volume, high-velocity and high-variety data, fosters consumer demand for the most relevant and recent information. As consumers prefer the information at few easy-to-remember places, Incentive 4 is further strengthened. Comprehensive platforms are well positioned to provide consumer-demanded curation, given the granular consumer profiles they are able to construct from multiple business verticals. This may mean that the concerns regarding vertical integration in Example 1 and data as an entry barrier in Example 5 are difficult to distinguish from platforms simply servicing an increasing consumer need for simplicity, curation and standardization.

Furthermore, because of information overload, user attention is increasingly scarce, fragmented and random. As big data enables targeted advertising, it is not difficult to monetize user attention via advertising. This in turn motivates zero or even negative price for the product itself. If data can further help improve product features, it is even more attractive to earn revenue through data and attention

than through fiat currency. As shown in the example of hidden fees (Example 4), competition in data and attention could exacerbate the situation for consumers, especially if they have limited attention in the face of overwhelming information. We can summarize this into:

Incentive 5 [Data Utilization]: When consumers have information overload and limited attention, competition could intensify data utilization by firms and platforms. This could, on the one hand, reduce product price and improve product features for the benefit of consumers, while on the other hand generate opportunities for exploiting consumers' limited attention.

As providers of personally identifiable data, many consumers worry about data security, especially when the firms and platforms that receive their data do not incur the full cost of breaches. The bigger the trove of personal data that a firm or platform possesses, the greater the impact of data breaches, and the wider the potential wedge between firm/platform and planner incentives pertaining to investment in data security. In short, we have:

Incentive 6 [Data Security]: To the extent that firms and platforms incur less than the full cost of data breaches, they will underinvest in data security.

For consumers, the data security tradeoff between signing up with many, potentially less secure but also less targeted service providers and signing up with few, potentially more secure but also more targeted platforms, is increasingly weighed in favor of the latter, as platforms vertically expand their offerings. On the one hand, this shift is in line with consumers choosing actions that will reduce their information overload and enhance their consumer surplus; on the other, it could make entry into the platform type of business more difficult. In other words, data security has concurrent consumer protection and antitrust implications, as highlighted in Examples 1 and 5.

3.4 Market consequences

To understand market outcomes, we must understand both demand and supply. On the supply side, firms and platforms have their own incentives to collect, store, secure, use, and improve data, which may align with or differ from what a social planner prefers. On the demand side, the low cost of data-driven content creates information overload for individual consumers. Consumers' incentives to consolidate their interactions may in turn drive firms and platforms to come up with new ways of reducing information overload, as in Example 3. Combined, such dynamics can both enhance consumer

welfare as well as accelerate data concentration and the consolidation of consumer interactions with fewer firms and platforms. Moreover, the dynamics can encourage firms to monetize through data and attention, or even exploit consumers' need for simplicity as in Examples 2 and 4. The resultant market outcome is thus a consequence of both demand and supply. Consumer protection and antitrust agencies tend to attribute the observed outcome to a specific supply-side mechanism (e.g., a firm exploiting consumers' inattention), but the other demand-side mechanisms (e.g., consumer demand for simplicity) are often just as relevant to the outcome.

Today, policy makers are considering additional law enforcement actions or new legislations concerning big data. However, before taking such actions, one must first ask a couple of positive questions: (i) What is the current status of data collection, data flow and data use? (ii) To what extent is data concentrated or dispersed across different types of firms and platforms?

Some researchers, to be reviewed in Section 4, have already begun to empirically address these questions. Many factors could contribute to growth in data use and data concentration, including positive network effects within platforms, firm and platform incentives to collect data for themselves only, and consumer preference to overcome information overload by focusing on a few destinations that offer comprehensive data for consumption. However, equally important are potentially counteracting factors. For example, there could be dis-economies of scale or scope that discourage unproductive investments in large firms or platforms; platforms with comprehensive data often face the additional challenge of reducing consumers' search costs while still satisfying consumer demand for the most relevant data; and technological advances in data may lower the barriers to entry for either a platform or for a firm on one side of a platform. Whether the market will become more concentrated data-wise and/or platform-wise depends on the interplay of all of these factors.

Should the market become more concentrated in data and platforms, the need for new policy interventions depends on the social planner's objective function and her beliefs about the main mechanisms that contribute to the concentration. For example, if the social planner aims to maximize consumer welfare and views data and platform concentration a result of consumer preferences, she may conclude that the concentration is the market-driven solution to address consumer preferences, and there is no market failure to address with new policy interventions. In contrast, if the social planner believes that she has better information about consumers' preferences than consumers themselves, it could justify a paternalistic intervention. Alternatively, the social planner may respect the preferences of consumers and their ability to choose and factor in downstream considerations, but worry that the current market

setting prevents the most efficient firms and platforms from serving consumer demand. In that case, one has to clarify what mechanisms in the current market contribute to the perceived inefficiency, and why the proposed fix would effectively address the concerns about those mechanisms at a reasonable cost to society.

4 Related literature

A number of regulatory approaches have been proposed to address potential market failures involving big data and digital platforms.²⁶ In no particular order, those broadly pertain to data privacy; data security; data compatibility, portability, inter-operability, and sharing; data concentration and market dominance; unfair, deceptive and opaque data practices; and firm-specific data policies.

Aspects of data and information have long been considered in economics, including beliefs about agent types, type screening, signaling, market segmentation, incentive-compatible contracting, and voluntary disclosures (e.g., Harsanyi, 1967; Akerlof, 1970; Spence, 1973; Hölmstrom, 1979; Grossman, 1981; Milgrom, 1981). The recent literature that is more specific to digital economies builds on these works, and can be crudely categorized into how data interactions may influence the usual forms of market failures—in terms of asymmetric information, externalities, market power, and bounded rationality.

Asymmetric information changed by data: Recent works have looked at questions concerning what data is collected by firms, how it is used and traded, and who owns, controls and secures the data (Levin and Milgrom, 2010; Acquisti et al., 2016; Bergemann and Bonatti, 2015, 2019; Bergemann et al., 2018). Researchers have also studied how firms may seek to profile specific consumer traits and interests in order to optimally segment markets and more effectively price or quantity discriminate (Taylor, 2004; Burke et al., 2012), as well as how these dynamics may influence firms' chosen data practices (Armstrong and Zhou, 2016; Chen et al., 2016; Cohn et al., 2016; Evans, 2017; Hoffman et al., 2018; Jin, 2018; Colangelo and Maggiolino, 2018; Lambrecht and Tucker, 2018; Dinerstein et al., 2018; Sharma and Wagman, 2019). These works underpin a growing information asymmetry between firms and consumers in digital economies, as firms utilize existing and new technologies to gain insights into consumer preferences and behavior that the consumers themselves may not fully recognize. While market failures can result from firms obfuscating their data policies, the literature has shown that market failures can take place in situations where consumers are fully rational and have complete

²⁶See, e.g., US Federal Trade Commission (2014), UK Digital Competition Expert Panel (2019), Crémer et al. (2019), and the Stigler Committee report (2019).

information regarding how their data will be used (Kim and Wagman, 2015). At the same time, the literature has shown that the impact on consumer surplus and overall welfare of reducing information asymmetries on the other side—in terms of consumers revealing information to firms—depends on the specific structure of the market (Taylor and Wagman, 2014; Kim et al., 2019).

Externalities changed by data: The literature has shown that even when consumers are fully aware of the consequences of providing their consent for data collection, excessive collection can occur in equilibrium. Excessive data provision takes place for two reasons. First, due to information externalities, some users’ decisions to share their personal information may allow firms and platforms to infer more information about non-users; combined with a coordination failure among users, this leads to a Prisoner’s Dilemma situation, where individually each user finds it optimal to excessively provide data but collectively all users are worse off as a result (Conitzer et al., 2012; Choi et al., 2018). Second, despite consumers recognizing that lower (or zero) prices are associated with excessive data collection, they may nonetheless decide this tradeoff between ‘lower prices and less privacy’ and ‘higher prices and more privacy’ in favor of the former (Burke et al., 2012; Kim and Wagman, 2015). Recent works have also shown that lower costs for storing data may exacerbate the risks of data breaches (Miller and Tucker, 2011; Goldfarb and Tucker, 2017; Jin and Stivers 2017), and that data concentration raises the stakes of data portability and accessibility decisions, where firm incentives and economic efficiency may be misaligned (Caillaud and Jullien, 2003; Halaburda and Yehezkel, 2013; Katz, 2014; Cornière, 2016).

Market power changed by data: Researchers have shown that policies that aim to enhance data protection may raise costs for entering firms as well as switching and adoption costs for consumers, increasing barriers to entry and hampering innovation (Gehrig and Stenbacka, 2007; Goldfarb and Tucker 2011ab, 2012ab; Lambrecht and Tucker, 2015; Campbell et al., 2015; Jia et al., 2019). The concentration of data in fewer hubs can help sustain market dominance, entail an erosion in consumers’ ex-ante anonymity in firm-to-consumer interactions, and tip the scales in favor or against contested mergers (Conitzer et al., 2012; Lee, 2013; Shy and Stenbacka, 2015; Rubinfeld and Gal, 2017; Chiou, 2017; Ezrachi and Stucke, 2017; Chiou and Tucker, 2017; Kim et al., 2019), but restricting data utilization can backfire (Lefouili and Toh, 2019; Sabatino and Sapi, 2019). At the same time, the literature has shown that data concentration is the expected result of costly global infrastructure, scale economies, centralization and standardization of interactions, concentration of consumer trust, and demand for personalized and more accurate data-enhanced services (Ellison and Ellison, 2009;

Wickelgren, 2015; Cohen, 2017; Jin et al., 2018; Choi et al., 2018; Adjerid and de Matos, 2019).

Bounded rationality changed by data: Data privacy and security concerns combined with information overload may distort consumer behavior, and potentially drive some consumers to interact with fewer firms and platforms and proceed under the default options of their data policy menus (Pavel, 2009; Tsai et al., 2011; Acquisti et al., 2015). In turn, platforms' network effects may be amplified, which can further enhance consumer profiling, increase data concentration, and help entrench market power (Acquisti et al., 2015; Jann and Schottmüller, 2018). Profiled consumer traits, asymmetric information and bounded rationality can be leveraged by firms and platforms to obfuscate prices, present misleading data policies and product information, and to direct consumer attention towards primary and data interactions that are more profitable (Spiegler, 2006; Gabaix and Laibson 2006; Brown et al., 2010; Chiou and Tucker, 2012; Armstrong and Vickers, 2012; Salinger and Levinson, 2015; Ibarra et al., 2017; Shiller et al., 2017; Jin et al., 2018). Such concerns about firms' data practices are exacerbated by the likely irreversibility of data decisions and the information externalities that are associated with them (Taylor, 2004; Acquisti and Varian, 2005; Acquisti and Gross, 2009). At the same time, access to granular, real-time data enables firms to better understand consumers' bounded rationality and design data-driven interventions that nudge consumers towards more socially desirable behavior (Allcott and Rogers, 2014). Data collected (e.g., by smart wearable devices or by email service providers) can even help sophisticated consumers to consciously battle their own bounded rationality (for instance, by incentivizing exercise through nudges, competition and charity pledges). In this sense, data practices can also help overcome rather than aggravate market failures from bounded rationality.

5 Conclusions

The complexities that the digital economy introduces with respect to the utilization and commercialization of data have brought to the fore consumer demand for transparency, simplicity, attention guidance, and curation. These demands may conflict with each other, be exploited by the supply side, as well as change over time. Firms and platforms face concomitant questions regarding how to satisfy, guide, or even mislead consumer demand for information and attention, as they take into account how data feedback effects, fast changing technologies, and new data-aided business models may alter their competitive and regulatory landscapes. These questions inextricably tie matters of antitrust and consumer protection for policy makers, as firms experiment with different products and technologies, and as com-

petition leads them to develop new data-driven offerings to satisfy consumer demand. Policy makers face questions about how different data and competition policies may affect market ecosystems, and, taking into account market failures, the potential effects of regulation on their own firms and citizens, as well as the geopolitical interests of other nations, their policy makers, and their firms.

Within a country, antitrust and consumer protection are often run by different government agencies. Even if they are housed in the same agency (e.g., within the FTC), the two policy areas are often run by different bureaus and governed by different laws, with little consideration for the spillovers between the two (Kovacic and Mariniello, 2016). Consider two policy-making agencies, A and B , with different but overlapping social and market objectives, with agency A seeking to maximize v_A and agency B seeking to maximize v_B , but only one agency can be in charge at a time and pursue its objective. Let v_A^* and \hat{v}_A (\hat{v}_B and v_B^*) denote A 's (B 's) realized outcome when A is in charge and when B is in charge, respectively, and let $\Delta_A = v_A^* - \hat{v}_A$ and $\Delta_B = v_B^* - \hat{v}_B$ denote the cost of not being in charge for either A and B , respectively; or, alternatively, the externality created by the other agency. Due to spillovers and lack of regulatory specialization in the other's objective, neither agency is able to individually internalize the externality it imposes on the other. In this paper, we have essentially argued that data-related market failures influence Δ_A and Δ_B , to the degree that they are considerably more pronounced in the digital economy than in classical markets. As a result, failures to internalize inter-policy spillovers can result in substantial welfare losses. We propose that, as part of each agency's objective, an intra-agency evaluation process should be conducted to determine and minimize such spillovers—in effect, aiming to approximately maximize a joint objective that incorporates v_A , v_B and their overlaps.

Although there has been significant recent global activity with respect to both data regulation and supply-side data-related policies, it is important to bear in mind that the digital market is still at an early stage, and while firms and platforms are experimenting, policy makers are experimenting as well, and the current stakes of correct regulatory action could be exceedingly high. This is precisely where economic research could be very helpful. Unlike policy or legal analysis, economic analysis is not confined to either the silo of antitrust or consumer protection. Take any potential action from a particular agency under a particular theory of harm—economists could examine and quantify the unintended consequences from that agency's actions on the other. While each policy may have winners and losers, even within the same market side, economic research is driven by social welfare evaluations, and offers consistent methodologies to weigh in tradeoffs and to quantify and compare the costs and

benefits for all of the different groups and segments of economic actors.

Economic research can help guide the vast number of open policy questions and contribute to an integrated policy framework that addresses matters concerning antitrust, consumer protection, and geopolitical considerations, as well as their potential spillovers with each other. For instance, if policy calls for establishing a certain class of platform firms that should be specifically regulated under stricter policies to encourage competition and protect consumers (e.g., governing data protection, data availability, sharing, portability, and standards), much economic justification is needed to examine whether and why such policy is necessary. If the answer is yes, what is the consumer surplus or welfare maximizing approach for identifying those firms? What differential treatment is appropriate and enforceable? Such policies should take into account the broader effects—for instance, the incentives of firms to become platforms and to innovate, and the incentives of other nations to adopt similar rules.

These questions provide avenues for future research, and where data is not available, theoretical models and structural analyses with simulated counterfactual estimates can be used to generate policy implications. Importantly, despite the inherent complexities, some policy prescriptions have less ambiguous consequences. For instance, a policy that aims to standardize consumer choice with respect to how much of one’s data can permissibly be stored and processed by firms may reduce information overload and limit the degree to which data disclosures and controls are obfuscated, paving the way for more informed consumer consent. In a similar vein, a policy that aims to more closely align firms’ costs of data breaches with societal costs can help bring firms’ incentives for investing in data security closer to the social optimum. To evaluate the economic impact of other policies, a piecemeal rather than an omnibus approach to data regulation may be beneficial. Economic research can continue to help identify policy prescriptions that benefit welfare, create fewer conflicts in existing regulatory focus areas, and do not diminish firms’ incentives to invest and innovate.

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