

Competition in Digital Markets
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Abstract. How should we understand competition in markets where data is an implicit commodity in the transaction? This Chapter argues that we should understand markets in data as an example of a market for joint products, namely the commodity that the purchaser is receiving and the data revealed to the seller. This model of joint products has implications for competition policy even in environments that might seem to be competitive as to price. Therefore, competition authorities should pay special attention to competition law enforcement in settings involving transfer of data. The Chapter provides numerous examples and options for competition authorities to shape their policy responses.

I. Goods, Data, and Markets

Of all the freedoms unleashed by the Internet and the World Wide Web, none has been more influential than the expansions in the domain of commercial transactions. Speech may be more free, content may be more readily copied, personal networks may be more expansive (at least among those who can leap across the digital divide), but there is no doubt that shopping has become much easier with advancements in information and communications technology. The digital marketplace opens up a broad scope for freedom in transacting. Anything can be bought, anything can be sold through a well-recognized set of clicks, taps, or swipes.

As the Internet expands the freedom to transact, one might expect market transactions to become more efficient. Theory teaches us that as transaction costs are reduced to zero, willing buyers can find willing sellers and negotiate price, quantity, and other contract terms. Buyers and sellers each benefit from the sale, and gains from trade are realized throughout the economy. Furthermore, communications technology allows buyers to communicate with other buyers improving the information about products and services as buyers approach sellers. Opportunistic sellers and buyers are readily punished and excluded from the marketplace. Improved information further facilitates efficient transactions.

Do the freedoms made possible by the Internet really support a regime of laissez-faire? This chapter argues that the freedom to transact at low cost does not necessarily lead to a deregulated frictionless market. The central insight is that transactions on the Internet are inherently different from traditional bricks and mortar transactions. While a buyer and seller in a shop exchange money for a product or service, market exchange across the Internet is multidimensional. A buyer not only gives up money and a seller does not give up only a product and service. Communications and information technologies allow the transaction costs for the

exchange to fall, but these same technologies also lower the cost of collecting information. Sellers can keep track of previous sales by buyers, collect demographic and other information about buyers, and in many cases measure usage of the product. Similarly, buyers can collect information about sellers, share the information with other buyers, and use data analytic tools to negotiate more effectively with online sellers. Once transaction costs fall and freedoms to transact unleash, many dimensions of a transaction also become transparent and part of the deal.

This insight has implications for how we understand markets. Typical economic analysis focuses on price and quantity. Sellers and buyers interact in a market where prices are set through market forces, fueled by information, and transacting parties often are negotiating over quantity. Under these conditions, economic analysis would predict that with a large number of buyers and sellers, markets will be efficient in allowing all beneficial exchanges to occur.¹ Consumer and producer benefits are maximized. Competition law and other forms of regulation intervenes into the market only when sellers or buyers collude to set price in the marketplace or attempt to monopolize the marketplace.

However, Internet transactions are different. When a buyer buys a desired product or service from a seller online, the buyer not only transfers money but also information about herself. Similarly, the seller transfers its product or service and information about itself. Every market transaction potentially produces a joint product. Even with anonymous exchange, metadata is still available and sellers can collect credit card and other payment information that would allow them to track and aggregate transactions. Economic analysis shows that markets for joint products are not efficient.² Contracts may be more complex and detailed, but the aggregate set of transactions across all sellers and buyers in the marketplace will be inefficient. The theoretical prediction is that markets may not maximize benefits to consumers and producers as in traditional markets driven solely by price.

A classic example of joint production is from agriculture. A sale of a farm animal, like a sheep, entails the transfer of at least two products: meat and wool. But the technology for separating wool and meat from sheep is fairly straightforward and two traditional markets for wool and meat can be derived from the sale of sheep. However, in many cases,³ joint production can

¹ See Charles Wheelan, *Naked Economics* 17-18 (Norton 2010).

² See Mishan, *infra* note 4.

³ Without getting lost in too many technical details, let me illustrate with some simple examples. Suppose an average sheep generates m units of meat and w units of wool. If sheep sell for p_s per unit and meat and wool sell for p_m and p_w respectively. Then, if markets are working perfectly, the revenue from selling sheep should equal the revenue from selling meat and wool, or $p_s s = p_m m + p_w w$. The cost of producing and distributing sheep would be $c(s)$ where $c(\cdot)$ represents the cost function. The typical firm in this market would seek to maximize profits, or the difference between revenues and costs. For the typical firm, the profit maximization problem is invariant to whether we think of the market for sheep or the market for wool and meat separately. Joint production does not pose problems for traditional market analysis in this simple case.

create problems for traditional markets, requiring some form of intervention into the market through law or administrative style regulation. Take the other classic example of joint production: pollution. The production of steel, for instance, yields the final processed steel that can be used as an input for various products and metal scrap and other waste that needs to be disposed of. The technology for generating pollution may not be cleanly mathematically related to the processing of steel as it is for wool and meat. Markets may be more difficult to sustain because of the difficulty in pricing the two products.⁴ Rules would be required to generate such markets such as the rule that all waste has to be cleaned and disposed of by the producer, creating the basis for markets in waste management.

The pollution example shows that another way to understand the issue of joint products is in terms of externalities. As with steel product, so Internet transactions also yield externalities. When a buyer purchases an item from a seller, the transaction entails not only the transfer of the item but the generation of information. This information externality may not be priced separately; essentially, the buyer and seller are generating the information for free. Because of this failure in pricing, markets will not be efficient. Some form of government intervention is necessary. Furthermore, for reasons we will discuss in Section Two, information externalities can lead to market dominance due to economies of scale in product and distribution. Whether understood in terms of joint products or information externalities, online transactions occur in different market context than traditional markets for products and services in the offline world.

Of course, information is also generated in the bricks and mortar world. The point is that the lowering of transaction costs through information and communication technologies also lower the costs of generating, collecting, and analyzing information. Economic analysis of traditional offline transactions can ignore the information externality or joint product issues. But analysis of

Now consider the steel example discussed later in this paragraph. Let the price of steel be designated as p_t and t units of steel. The cost of producing steel is $c(t)$. The problem is that producing steel also produces waste, which can be designated as g . The profit maximization problem for the firm does not take account the production of waste. Institutions have to be created to deal with the waste, otherwise it is produced jointly with steel at zero cost for the firm but positive cost for society. The analysis in the text illustrate the familiar ways to deal with waste from taxing its production, taxing the consumption of steel, mandating disposal of the waste so private entities have to bear the cost of waste, or creating markets so waste removal is priced effectively.

With respect to information, joint production is even more complex. Consider the market for any product or service. Under the analysis in the text, the transaction for the sale of a product or service on the Internet also generates information about the parties to the transaction. However, such information may be impossible to quantify, unlike the other commodities discussed above, whether meat, wool, sheep, or waste. The challenge is to design institutions and transactions to accurately account for the information produced. This Chapter analyzes the transactional and institutional design issues when information is produced jointly with products or services.

⁴ For economic articles on joint production and externalities, see E.J. Mishan, 'The Relationship Between Joint Products, Collective Goods, and External Effects' 77 *Journal of Political Economy* 329 (1969); Richard Cornes & Todd Sandler, 'Easy Riders, Joint Production, and Public Goods' 94 *The Economic Journal* 580 (1984).

online transactions cannot without leading to a false notion that markets are laissez-faire with no need for regulation or competition law.

Other scholars have identified the special market dynamics of online transactions. Lina Khan in her study of Amazon points to the irrelevance of Chicago School analyses of antitrust that rely on outmoded models of price competition.⁵ Perfect competition models lead to misleading policy recommendations and legal interventions when applied to the wide range of digital markets made possible by Amazon. She advocates an antitrust analysis that is more attentive to the competitive dynamics and structural conditions of markets. Maurice Stucke follows a similar line of analysis in his idea of virtual competition, a framework for assessing competition failures arising from Internet platforms, such as Amazon.⁶ This chapter is in the spirit of the work of these scholars but with a more focused discussion of joint products and information externalities.

Starting from a reconceptualization of market competition for online transactions in Section Two, this chapter applies this approach to specific transactions: search, online purchases, and matching services in Section Three. Novel theory and applications have implications for competition law and regulation, the topic of Section Four. Finally, the last section concludes and sets forth a path for future research.

II. Conceptualizing Market Competition

This section presents the ideas of two contemporary scholars who have analyzed digital markets. Their work serves as a necessary foil to my analysis of information externalities and joint production in digital technologies. The goal is to give readers a summary of current debates and a context for assessing my suggested approach to digital antitrust.

As the title of her article suggests, Lina Khan's Amazon's Antitrust Paradox is a challenge to Robert Bork's revolution in antitrust law set forth in his 1978 manifesto *The Antitrust Paradox*.⁷ Bork's famous insight is that allowing firms to engage in anticompetitive agreements can sometimes benefit consumers. For example, restrictions on resale price can create incentives for investment in service and quality by retailers thereby benefitting consumers.⁸ As another example, alleged predatory behavior by large firms can benefit consumers through reduced prices.⁹ Bork resolves these paradoxes by pointing out that the goal of antitrust is to promote business practices that benefit consumers even if these practices are ostensibly anticompetitive.

⁵ Lina M. Khan, *Amazon's Antitrust Paradox*, 126 *Yale Law Journal* 564 (2017).

⁶ Ariel Ezrachi & Maurice Stucke, *Virtual Competition: The Promise and Perils of the Algorithm-Driven Economy* (Harvard 2016).

⁷ Robert Bork, *The Antitrust Paradox: A Policy At War With Itself* (The Free Press 1978).

⁸ *Id.* at 280.

⁹ *Id.* at 347.

Lina Khan, in her article, points to Amazon as a counterexample to Bork's claim. Amazon's low-price strategies seemingly benefit consumers. But Khan describes the dominant companies as predatory. Low-prices serve to maintain Amazon's dominance and allow it to obtain and sustain market power in a range of markets: books, appliances, movies, publishing, groceries. If Khan is correct, the question is what Bork got wrong. According to Khan, Bork's analysis rested on a simplistic model of price competition.¹⁰ This model ignored the many dimensions of competition among firms, including variations in quality, quantity, tailoring to particular consumer needs and uses. Once competition is understood as multi-factorial, and not simply about providing consumers with the lowest price, market dominance and the resulting ability of firms to extract rents from consumers can persist even in a world where consumers, on the surface, benefit from lower prices. Antitrust law must look beyond price to examine the dynamic effects of predation and the many dimensions of consumer satisfaction. Low prices, in other words, can come at a cost to consumers.

Khan's point is counterintuitive and raises many questions. She points to a need for alternative models of competition that capture consumer benefits more realistically than Bork imagined. These alternative models would be structural, identifying the informational and transactional environment against which markets function.¹¹ Although her article, limited to the example of Amazon, points us partially in the direction of these alternatives, there is still much work to be done. Maurice Stucke fills in some of the gaps in his book *Virtual Competition*. Where Stucke helps is in presenting the technologies for competition in digital markets. One such technology is algorithms, which potentially allow firms to fix prices. Another is the platform access to which can be controlled through business strategies implemented by the platform's owner. On the last point, Amazon's competitive dominance comes from superior access to a retail platform. But Google also has an advantage through search. Stucke provides the technical details to Khan's desired structural take on competition.

While Khan's main policy recommendation is to reject Bork's limited view of antitrust enforcement, she does not point to concrete interventions. Stucke is equally tentative, ending each chapter of his book with a brief section entitled "Reflections" which set forth how policymakers perhaps, maybe might respond to the potential threats to competition that could exist.¹² Both scholars share with their nemesis Bork, a strong sense of caution in bringing antitrust tools to bear on the actual economy. However, the valuable lesson from the work of Khan and Stucke is that we should not adopt Bork's sanguine attitude that the market will work, even if we cannot be completely confident that the government will succeed either.

¹⁰ Khan, note 3 at 737.

¹¹ *Id.*

¹² Stucke, *supra* note 4 at 26.

This Chapter has a bit more aggressive tone than the writings of Khan and Stucke. There are identified ways in which markets can be corrected. But there are a range of options which involve creative considerations of contract, property, and market regulation. This Chapter contributes the model of information externalities, framed in terms of joint production, which allow some more nuanced predictions of market behavior that complement what Khan and Stucke offer. While Sections Three and Four provide concrete illustrations and policy recommendations, this section concludes this section with a discussion of the conceptual framework.

The competitive dynamics both Khan and Stucke identify arise from the information externalities created through digital transactions. In a digital transaction, buyers and sellers receive information from each other as part of the sale of a product or service. This information can be metadata about the identity of the parties and financial information pertaining to the transaction. Whether or not this data is saved, it is generated and could be used, absent legal or technological restrictions. While it is true that bricks and mortars transactions also generate information, digital transactions are different because the information can be generated, saved, and transformed at lower cost. A reasonable starting point for analyzing digital transactions is recognizing the existence of information externalities.

The presence of externalities has implications for the competitiveness of markets.¹³ First of all, markets for digital transactions will not be efficient unless the externalities can be internalized in some way within the transaction. Absent such internalization, each transaction will be incorrectly valued because the benefits and costs of the information externalities will not be correctly assessed. Internalization of externalities requires the definition of property rights so that the seller and buyer can contract over pricing and use of the information. For example, suppose the buyer is given the right to keep others from using her information. The seller will then have to purchase these rights from the buyer, and the contract will contain terms on what uses seller can make of buyer's data and how much seller must compensate the buyer. Alternatively, if the seller has the property right, the buyer would negotiate a lower price for the transaction. Once property rights are defined contract terms can more carefully be tailored to meet the needs of the parties.

Furthermore, property rights definition and negotiations over information will have implications for the competitive dynamics. It is on this point that the insights of Khan and Stucke become relevant. If each market transaction for a product or service also involves a transaction over use of information, then each transaction is potentially idiosyncratic. Markets for products and services would be thin as transactions would not be perfect substitutes for each other. Deviation from perfect substitutability means that the conditions for perfect competition will not exist. In a perfectly competitive market, an attempt by a single firm or a single buyer, acting

¹³ Kenneth J. Arrow 'The organization of economic activity: issues pertinent to the choice of market versus non-market allocations', in Arrow, Kenneth J., *Collected papers of Kenneth J. Arrow, volume 2: general equilibrium*, (Belknap Press 1983).

unilaterally, to move the terms of trade more favorably in its directions will inevitably fail because a competing firm or buyer can offer better terms. A single firm attempting to charge a higher price or scrimp on quality will lose to a competitor. Competition provides discipline of anticompetitive conduct. Similarly, if firms or buyers band together and collude to move the terms of trade in their favor, competitive dynamics would make such collusion as unstable as there is incentive to cheat on the terms of the collusive agreement.

When there are externalities arising from the transfer of data, competitive pressures weaken. A buyer may be willing to trade off access to personal information for a lower price. A firm promising to respect privacy may charge a higher price to implement privacy guards, but will soon be undercut. Each transaction entails terms on price, quantity, and information generated and transferred between the two parties. Information from one transaction may not be as readily fungible with information from another transaction. The place where a buyer has chosen to purchase a product, the type of product, the quantity, all provide information that cannot be readily mimicked in another transaction. This lack of substitutability makes market dynamics less than perfectly competitive.

The challenge is determining how much these competitive dynamics deviate from that of a perfectly competitive market. Stucke, for example, identifies how the processing of information through algorithms allows for potentially collusive behavior.¹⁴ Furthermore, he points to monopoly power arising from ownership of platforms, whether for distribution or for search. Khan, with her focus on Amazon, focuses on pricing policies that are predatory allowing a platform company like Amazon to branch out into a range of markets.¹⁵ How do these dynamics relate to the presence of information markets and thin markets for transactions?

The answer in part is one of scale. Companies that can collect information can do so at decreasing average cost of collection and processing. The marginal costs of collecting and processing additional information are close to zero because of technologies, for example, like bots that allow the aggregate collection and organization of data. These scale effects allow companies to grow as they can cheaply collect data with every transaction entered. Furthermore, companies can also charge a lower price for goods and services in exchange for collecting data from customers. This tactic is what makes companies like Amazon successful in expanding while undercutting competitors, a dynamic that Khan describes as predatory. Stucke's example of algorithms show how firms can converge on the same information processing technology for setting price, resulting in collusive behavior in pricing without explicit communication.¹⁶

¹⁴ Stucke, *supra* note 4 at 56.

¹⁵ Khan, *supra* note 8.

¹⁶ *Supra* note 4 at 71.

In addition to the scale effects in collecting information algorithmically, assessing information, the costs of capitalizing and processing information can influence competitive dynamics. As Stucke suggests, firms may converge on information algorithms that facilitate tacit collusion and anticompetitive conduct.¹⁷ His example is one of inter-firm information processing. But intra-firm information processing is relevant and may vary across firms. Consider Khan's example of Amazon. By creating a dominant platform for buying and selling merchandise, Amazon can collect information at relatively low cost from consumers. By extending this platform across a range of markets, the company can also collect and process information from a range of markets. A consumer buying a book on fishing may also buy fishing equipment or a trip to the Everglades or the Great Lakes. Amazon can create a complete profile of its consumers and project purchasing needs and wants. With this body of information, the company can price and advertise more precisely. Furthermore, Amazon offers an affinity credit card. With this entry into the world of finance, Amazon can further track purchases and expenditures, information that allows the company to assess purchasing behavior of individual customers and pricing behavior in the aggregate market. Companies not only can converge on identical algorithms, as Stucke suggests, but may also be engaged in competition with respect to algorithms. As companies obtain scale advantages in collecting data, it can obtain advantages in processing as well.

As these two points show, competitive dynamics in digital markets is not solely about price. Competition is on quality of products, quality of information, and the collection and processing of data. These additional dimensions of competition are not captured within the traditional, Borkian framework of antitrust economics, as Khan shows. Although Bork and his followers might counter by pointing to the scholar's involvement against Microsoft in the antitrust case and his reliance on the antitrust classic *Lorain Journal*¹⁸ as the keystone for competition in information markets, the reliance on *Lorain Journal* is not responsive to the broader concerns of digital antitrust. At issue in *Lorain Journal* was a contractual restriction imposed by a newspaper on its advertisers preventing them from advertising with radio stations.¹⁹ This restriction is a refusal to deal or group boycott provision that is without question anti-competitive. In the digital context, the competitive issue is not solely about one competitor preventing a customer from dealing with another competitor. Of equal, or perhaps greater concern, is predatory behavior that allows a firm to obtain dominance through behavior entailing a combination of pricing and information gathering. Bork's antitrust economics with its focus on lowering prices for consumers fail to address more complex competitive dynamics.

The complex competitive dynamics is as follows. Since every transaction in a digital marketplace has an information component and a traditional price/quantity component, the question is to what extent can a competitor identify the information component and process it for

¹⁷ *Id.*

¹⁸ *Lorain Journal v. United States* (1951) 342 US 143.

¹⁹ *Id.*

a competitive advantage. If a competitor is giving a customer a concession, can a firm identify the concession and match it in enough time to steal away the customer? This question is the corollary to the point about the failure of perfect competition raised above. To the extent transactions are not transparent, this lack of information can make it more difficult to compete. However, if a company can obtain information about transactions, more quickly than other competitors, this gained transparency would be a competitive advantage. One way for a competitor to obtain this advantage, of course, is to create shadow accounts with its competitors through which it gains information about transactions. There is nothing on its face illegal about this behavior. In the bricks and mortar world a firm might visit its competitors' stores and view its advertising. In the digital world, however, this form of snooping combined with the advantages in data gathering and processing can lead to big competitive advantages. A competitor can readily reverse engineer and implement its competitors trading strategies with customers and compete more effectively.

However, this ability to snoop does not restore the perfectly competitive marketplace where firms can respond instantaneously to a competitor's attempts to raise price. Information processing technologies and algorithms, or put alternatively hardware and software, may vary across firms because of differences in investments in research spending and technology. Competition in technologies may lead to a wide divergence across companies and serve to reinforce economies of scale within and across markets. Technology competition may lead to a dominant monopoly or to oligopolistic markets structure with firms of various sizes capturing different market shares based on their technological capacity.

Following from market concentration that technology differences can bring is the ability of a firm to price discriminate. The traditional notion of perfect price discrimination entails a firm charging each separate consumer its willingness to pay, capturing the full consumer surplus from the market demand curve. While this basic notion is still relevant in digital markets, the concept of perfect price discrimination does not reflect the ability of firms to profile consumers through the gathering and processing of information. By profiling a customer, a firm can provide a tailored product along the dimensions of price, quality, timing, and other characteristics. We can think of the equivalence of perfect price discrimination in the digital market as bespoke products. Such products are not necessarily exactly custom made to fit a consumer's desires. A firm gleans information from consumers, shapes the characteristics of the products based on the information profile, and may come close to a customer's ideal.

Price discrimination has been criticized as an exercise of market power. But scholars have pointed to the economic efficiency of perfect price discrimination despite the ability of a firm to capture the full consumer surplus.²⁰ As a benchmark, price discrimination is desirable to the extent that more consumers are served in a market than would be if price discrimination were not allowed. This standard may be hard to gauge in practice and may be harder in digital markets. Is society

²⁰ See Whelan, *supra* note 1 at 18-19

better off if consumers are given timely coupons for the purchase of a closely tailored coffee beverage or music MP3's based on past buying habits and predictions of future demand? Some may go so far as to claim these coupons as creating rather than meeting demand. Khan and Stucke would suggest that such tailoring can serve as a form of predation or other anticompetitive conduct as it may prevent consumers from switching to other suppliers. Bork, on the other hand, might conclude that the rapid response of a firm to consumer profiles is just satisfying the needs of customers in an efficient and pro-consumer manner.

These four general points about digital markets, although fairly precisely set forth, lead only to tentative conclusions. Most antitrust analyses, however, are heavily contextual and dependent on conditions of the marketplace within which actual business practices occur. *Per se* rules may be hard to find for digital markets, but that should not be surprising. The next section of this chapter examines several examples from contemporary digital markets to show the economic concepts in action. Before proceeding to these examples, a summary of two principles from this section is in order.

The first principle is the need to think beyond classic models of perfect price competition. Because of the multidimensionality of transactions in digital economies, focusing solely on price and quantity in the underlying contract between buyers and sellers is inappropriate. This section has demonstrated the many ways in which competition occurs in digital markets: competition over acquiring data by consumers and by firms, competition in processing data through information technologies and algorithms, competition in creating consumer profiles based on cross-market and financial transactions, and competition in providing tailored products for consumers. The next section will provide several examples of these forms of competition and will identify potential antitrust concerns. The fourth section of this Chapter will examine antitrust doctrine may address these concerns.

The second principle is that the informational externality that mark transactions in digital markets can be resolved through property rights, usually in the form of intellectual property. This chapter will not explore these property rights issues in much depth. They are the subject of other scholarly work that the reader can refer to.²¹ But one point is that the property rights solution to the information externality might affect the competitive dynamics of the marketplace. Rights that are granted too broadly might limit competition just as rights drawn too narrowly can create too much competition. Although beyond the scope of this chapter, this second principle will be discussed tangentially in the fourth section of the chapter dealing with doctrinal responses to anti-competitive behavior in digital markets. The bottom line is antitrust law might not hold all the answers, and more attention must be paid to the intersection of antitrust and intellectual property law.

²¹ See, e.g., Shubha Ghosh, 'Beyond Hatch-Waxman' (2015) 67 RLI 779.

These two principles in conjunction with the analysis of competitive dynamics in digital markets become more animated through study of actual controversies, the focus of the next section.

III. A Look at Transactions

“We’re paying with data all the time. But they’re not official transactions. So we don’t even realize we’re doing it.”²² So announced Kaspersky Lab as it launched its “Data Dollar Store” on September 7, 2017. At this store, customers can buy swag, in the form of artwork by the street artist Ben Eine, in exchange for giving up personal data. “Money won’t get you anywhere. So, when you decide what the art is worth to you, don’t think what you’re willing to pay—think what you’re willing to share.”²³ The price tag includes email addresses, Facebook posts, mother’s maiden name, photos on one’s smartphone, text messages and other pieces of “global currency.” Merchandise included Eine designed t-shirts, coffee mugs, and tote bags. “Just like art, data has value. But you can’t see or touch or hold that value. It’s intangible.”²⁴

Without pedantically picking at this last point (as a concept, value is needless to say intangible), I commend Kaspersky Lab for illustrating the central point of Section Two.. Data is currency, and digital transactions often entail transfers of data as well as transfer of money or other manifestations of value. “A study about the value of data earlier this year,” Kaspersky Lab reminds us, “also showed that people would give away their emotionally valuable data for surprisingly little amounts.”²⁵ The Lab created this online store as a publicity stunt with goal of promoting its internet security software (which itself has been the subject of scrutiny because of supposed connections to Russia and hacking). But its lesson is clear for the purposes of this chapter: data is a tradeable commodity. Beyond the narrow points of Kaspersky, however, is the broader point that competition over data acquisition and processing defines digital markets.

This section builds on the previous one by presenting examples of potentially anticompetitive conduct in digital markets. The examples include investigations of keyword advertising, price collusion, data privacy, and several white papers from the United States and European Union that diagnose anti-competitive conditions in the digital marketplace. Not only do these examples illustrate aspects of the theoretical assessment presented in the previous section, they also point to potential antitrust doctrines that might regulate the marketplace for the benefits of the consumers. The examples also add institutional details to the Khan and Stucke analyses beyond the examples of Amazon and platform technologies. A background normative assumption

²² ‘The Data Dollar Store,’ <<http://www.datadollarstore.com>> accessed September 14, 2017.

²³ Id.

²⁴ Id.

²⁵ Id.

to these examples is the need to design markets for the benefit of consumers. This assumption will be examined in some detail in the next section assessing antitrust policies and responses.

Keyword Advertising. The Internet facilitates one of the most important ingredients in the marketplace, consumer search for desirable products at affordable prices. Search engines lower the costs of this process by allowing consumers to identify potential sellers through terms that are keyed to the desired product. These terms could be generic names for the product (car, glasses, flowers) or specific trademarks that capture the brand being sought. When search engines execute consumer searches, they present the consumer with a menu of results that the consumer can read through. Sometimes these search results can be downloaded into a form that is suitable for the consumer to read, such as a spreadsheet. Often, the searcher must rely on the presentation template built into the search engine. The programming of this template allows for prioritizing of the search results, favoring some sellers over others. Sellers could pay the manager of the search engine to place links to its website first or to exclude links to competitors' websites. To what extent should this conduct be anticompetitive? That is the question in the Federal Trade Commission's case against 1-800 Contacts.

According to the Commission's complaint:

"1-800 Contacts entered into bidding agreements with at least 14 competing online contact lens retailers that eliminate competition in auctions to place advertisements on the search results page generated by online search engines such as Google and Bing. The complaint alleges that these bidding agreements unreasonably restrain price competition in internet search auctions, and restrict truthful and non-misleading advertising to consumers, constituting an unfair method of competition in violation of federal law."²⁶

These bidding agreements had been in place for over a decade and were ostensibly justified in terms of protecting the company's trademarks as they were presented in the search results. But the Commission expressed skepticism of this trademark-related justification:

"[the] bidding agreements are overly broad and not necessary to safeguard any legitimate trademark interest. The agency further argues that the bidding agreements hurt competition and reduce "the number of relevant, useful, truthful and non-misleading advertisements, by restraining competition among online sellers of contact lenses, and in some cases, by resulting in consumers paying higher retail prices for contact lenses."²⁷

²⁶ Eric Goldman, 'FTC Explains Why It Thinks 1-800 Contacts' Keyword Ad Settlements Were Anti-Competitive'(Technology & Marketing Law Blog, 18 April, 2017) <http://blog.ericgoldman.org/archives/2017/04/> accessed 6 September 2017.

²⁷ Id.

Evidence of the anticompetitive effects of the blocking of competitors' sites is substantial, according to the Commission. Contacts lost sales when its "lower-priced rivals placed advertisements" that would have been otherwise blocked by the agreements. Furthermore, the agreements with its competitors also led to "artificially depressed prices in millions of auctions held by the major US search engines for the display of advertising, thus depriving search engines of significant revenues they would otherwise have earned."²⁸ Additionally, the agreements harmed the search engines "by degrading the overall quality of the product that offer to consumers." Finally, consumers pay higher prices for contact lenses as Contacts' prices are "on average higher than that of other online merchants, often by a substantial amount."²⁹ In conclusion, Contacts "is consistently the highest-priced seller on the Internet and consumers do not know it."³⁰

The FTC's complaint illustrates the role of data in the competitive dynamics of digital markets. It also offers some insight in the role of background property rights in defining such markets. As to the role of data, the Commission provides a useful description of the search engine process:

In effects, users are continuously "voting" (with their clicks) on what is useful to them and what is not, and Google is continuously reacting to those votes, revising its SERP [Search Engine Results Pages] accordingly. Ultimately, Google is able to predict, typically with a high degree of confidence, what SERP will be relevant to any given user base on how many *other users* have behaved in response to similar SERPs constructed in response to similar search queries.³¹

Searching on the Internet is distinct from other types of search through broadcast or brick and mortar advertising. Engines provide unique value to both consumers and competitors in a marketplace.

Search advertising is uniquely valuable to advertisers because it puts an advertisement in front of a consumer at the precise moment the consumer is signaling her interest or intent by telling the search engine what she is seeking: it is literally the *right* ad, for the *right* user, at the *right* time.³²

In other words, firms can respond to consumer demand and tailor advertising for products according to the needs of the searching consumer. To take full advantage of this tailoring of advertising, keyword search should offer a diversity of choices. "Consumers," the Commission

²⁸ *Id.*

²⁹ *Id.*

³⁰ *Id.*

³¹ *Id.*

³² *Id.*

asserted, “not only understand that searches will bring ads from multiple companies, but have come to expect that variety.”³³

Trademarks can aid in the search process, but the Commission decisively rejected Contacts’ trademark protection justifications for its bidding agreements. Working against Contacts is its loss against Lens.com in a trademark infringement suit against a competitor that bid for use of a keyword search term contrary to the bidding agreement. In the Lens case, Contacts “lost decisively, twice. Lens.com is widely cited precedent on the limits of trademark’s infringement liability with regard to keyword bidding.”³⁴ Contacts’ trademark arguments were roundly rejected by the Commission:

A valid trademark invests the trademark owner with a far more limited right to bar only confusing uses of the trademark. On their face, the Bidding Agreements reach significantly beyond 1-800 Contacts’ property right by (1) barring non-confusing uses of the trademark; (ii) requiring negative keywords; and (iii) providing for reciprocal restraints on competition by 1-800 Contacts.³⁵

Background property rights, such as trademark rights, shape digital markets and can be important in assessing anticompetitive conduct. In this case, the Commission found that the company had exceeded its rights and entered into an anticompetitive agreement.

Price Bots and Tacit Collusion. A bot is a computer program that can be distributed across various websites to scour and collect data. The data scoured would include any publicly available information, such as e-mail addresses, phone numbers, contacts, job histories, and economic information such as prices or income. As many scholars have argued, most prominently Ariel Ezrachi and Maurice Stucke, sharing of economic information can facilitate collusion among competitors.³⁶ Such collusion would in general be anti-competitive. Because of the ease with which information is generated in digital markets, collusion may be easier in the digital environment. The difficulty is establishing an agreement and intention on the part of the competitors. These legal requirements are the subject of the next section. Here, we can focus on the mechanics of information sharing as it facilitates collusion.

Consider the offline environment first.³⁷ Often prices are posted. Petrol stations display their prices prominently. Retail outlets often advertise prices in the newspaper or distribute coupons to customers, offering price matching. With prices being so readily available, a competitor

³³ Id.

³⁴ Id.

³⁵ Id.

³⁶ Stucke, *supra* note 4.

³⁷ The Economist, ‘Price-bots can collude against consumers’(The Economist Online, 6 May 2017)<<http://www.economist.com/news/finance-and-economics>> accessed 28 August 2017.

can see what prices others are charging and set them accordingly. Through this process, prices will generally be uniform in the marketplace, especially if the market is geographically constrained. From an antitrust perspective, the question is whether these prices are artificially high or set close to the marginal costs of production. Both are possible even without any express communication among competitors. If one firm sees another firm charging a price above marginal costs, the firm can try to undercut or set close enough to the price charged by the competitor. All firms acting in this way might result in a situation where prices are set at above market rate through tacit communication even without an express agreement to set price.

The online environment exacerbates these price dynamics, potentially making it easier for firms to gather information in the setting of prices. As described, bots can scour websites scrubbing off pertinent economic information. Agents of a firm can pose as customers to obtain information through snooping schemes. Once the competitors' pricing data is gathered, a firm can set its own prices accordingly either as a direct match and through reverse engineering pricing algorithms that can be further refined to meet the consumers' needs and compete for their business. As in the offline markets, such sharing and reuse of price information can lead to tacit collusion and pricing above competitive levels even without an express agreement to set prices. Working in the other direction is the use of nonprice factors to attract consumers, such as desirable contract terms on returns and warranties, and the ability of new firms to enter a market and undercut the pricing strategies of incumbents.

Mergers & Acquisitions. A key argument in this chapter is that the individualized and idiosyncratic nature of data makes it difficult to create perfectly competitive markets in digital environments. Online transactions necessarily create informative externalities which are difficult to price and allow for firms to trade products and services for data while charging a below market price. The corollary to this argument is the problem of creating a market for data itself. "Flows of data," it has been noted, "are not a commodity: each stream of information is different, in terms of timeliness, for example, or how complete it is."³⁸ Data itself may not be a commodity, but individualized datum can be traded for commodities, as the Data Dollar Store experiment demonstrates. However, datasets, collections of data, may be closer to a commodity in the sense that they can be valued. A potential buyer can compare datasets as to completeness, coverage, and ease of use. While pieces of data are not fungible, collections can be.

One way that data is collected is in within firms. Ronald Coase famously called a firm a nexus of contracts with internal relationships and agreements often substituting for market relationships and contracts.³⁹ Just as conceptually accurate is to view firms as a nexus of data. Customer lists, trading formulas, employee contracts, know-how, secrets---all are constitutive

³⁸ The Economist, 'Fuel of the Future: Data is giving rise to a new economy' (The Economist Online, 6 May 2017) <http://www.economist.com/news/briefing/21721634accessed> 28 August 2017.

³⁹ R.H. Coase, 'The Nature of the Firm' (1937) 4 *Economica* 386.

elements of a firm. The creation and agglomeration of a firm is the development of a database. A firm's acquisition is the purchase of a data set. In a 2015 bankruptcy involving a subsidiary of a gambling establishment, the most valuable asset was the data on the 45 million customers who had joined the customer-loyalty program.⁴⁰ IBM also purchased the Weather Company to obtain the hardware infrastructure to collect weather data and the decades of weather data that had been collected.⁴¹ Health data also is a source of acquisition from government health services, private hospitals, and pharmacies that collect prescription data.⁴² While privacy regulations might protect individual patients, the value is in the aggregated, anonymized data based on customer profiles rather than discrete identities.

Although formal data markets have been proposed, data is traded through bilateral negotiations, usually in the context of a merger and acquisition. Antitrust law should take into account the value of databases and their potential misuse in assessing whether a particular merger should be approved. The next section addresses this point. Antitrust scrutiny might also turn to individualized data markets if they become implemented through the various institutions that have been suggested. Finally, antitrust attention should also turn to a recurrent theme in this chapter, the use of data as a term of consumer trade. As *The Economist* recently noted:

People give personal data away too readily in return for “free” services. The terms of trade have become to norm almost by accident, says Glen Weyl, an economist at Microsoft Research. After the dotcom bubble burst in the early 2000's, firms badly needed a way to make money. Gathering data for targeted advertising was the quickest fix. Only recently have they realized that data could be turned into any number of AI fixes.⁴³

Acquisition of data through acquisition of a company, or via merger, much like gathering of data through direct transactions with consumers, can be a basis for instituting the potential anticompetitive practices described in the previous section.

Data Privacy. Contractual terms restricting competition, such as refusals to deal or restraints on resale, can be the basis for antitrust violations. These suspect terms are often imposed on direct competitors or other parties in the chain of distribution, such as retailers and distributors. Terms imposed on consumers, such as terms of delivery or payment obligations are less suspect, but even in that domain, requirements to purchase a product or service as a condition of sale can be suspect as a tie-in or tie-out arrangement, particularly if the seller has market power. Controversial under antitrust are terms involving data collection and use. These offensive terms are viewed as a matter of privacy law, contract law, or at their worst a matter of deceptive or unfair

⁴⁰ See note 35.

⁴¹ *Id.*

⁴² *Id.*

⁴³ *Id.*

business practice. To treat restrictive terms regarding data privacy as antitrust violations seems to contradict antitrust's domain over anticompetitive business practices.

Nonetheless, Andreas Mundt, president of the Bundeskartellamt, Germany's competition policy agency, voiced concerns over unfair privacy terms as violative of antitrust laws.⁴⁴ The German office has launched an antitrust investigation into Facebook's policies on access and use of consumer data as an abuse of the company's dominant position in the marketplace. The legal theory for this claim seems to rest in questions of equity. While traditional antitrust principles focus on effects on economic efficiency as gauged by consumer welfare and prices, a more contemporary approach considers constituencies other than consumers and metrics other than prices and consumer welfare. Abuse of market dominance, the argument goes, has effects beyond those on aggregate consumer welfare. Distribution considerations should also come into play; a practice that hurts some consumers even though consumers as a group are better off is potentially anticompetitive. So are business practices that harm noneconomic interests. As one can imagine, Borkeans are suspicious of these expansions of antitrust enforcement although some would argue that these adverse effects translate readily into harms to consumer welfare and to increases in prices.

The conceptual model presented in Section Two may help to make sense of Mundt's position. If the terms of trade in digital markets involve a set of variables with the actual price being only one attribute, then other attributes may serve as proxies for price and antitrust scrutiny may be necessary to address abuses in the setting of these non-price terms. This scrutiny may be particularly relevant when the term of trade includes transfer of data from consumers to the seller. Just as price has been described as the central nervous system of the economy, so data is the central nervous system of digital markets. Manipulations of price give rise to antitrust scrutiny and so should manipulations of data policy. If the consumer is uncertain as to what data is being given up and on what terms of use, or if the usage of data is compromised so that the consumer gives up more data than required under competitive conditions, then antitrust law has a role to intervene. The problem is operationalizing these concepts. In the case of price, for example, charging an excessive price is generally not actionable under the United States antitrust laws although it can be in the United Kingdom and other member states of the European Union. If data is analogized to price, does the analogy mean that excessive collection and use of data by a company should not be actionable in the United States (while possibly actionable in Europe)? We will return to this question in the fourth section of the chapter.

White Papers. Three white papers have addressed the issue of competition and data with applications to digital markets: (1) The European Data Protection Supervisor (EDPS) Opinion on

⁴⁴ 'Digital Privacy Is Making Antitrust Exciting Again' (Wired Online, 4 June 2017) <<http://www.wired.com/2017/06>>accessed 28 August 2017.

coherent enforcement of fundamental rights in the age of big data (from August, 2016);⁴⁵ (2) the Organization of Economic Cooperation and Development (OECD) document on Big Data: Bringing Competition Policy to the Digital Age (from November, 2016);⁴⁶ and (3) NESTA's report, *Me, My Data and I: The Future of the Personal Data Economy* (from September 2017).⁴⁷ This section of the chapter concludes by presenting key findings from each report as background to the analysis of antitrust regulation of digital markets, the subject of the next section.

The EDPS Opinion seeks to develop a Digital Single Market Strategy to aid in coordinating the efforts of data policy enforcers in the several member states of the European Union. With that goal in mind, the Opinion identifies several areas where harmonized strategy is desirable. One key concern is competition:

Dominant companies in these [information-based] markets may be able to foreclose new entrants from competing on factors which could benefit the rights and interests of individuals, and may impose unfair terms and conditions which abusively exploit consumers. An apparent growing imbalance between web-based service providers and consumers may diminish choice, innovation and the quality of safeguards for privacy. This imbalance may also raise the effective price—in terms of personal data disclosure—far beyond what might be expected in fully competitive markets.⁴⁸

The Opinion echoes the principal concerns of Khan and of the general analysis in the second section of this Chapter:

[S]ervices priced at zero by profit-maximizing firms are as much a concern for authorities as services offered at any other price, though until recently investigations were rare. Where information is extracted for some purpose other than improving the quality or decreasing the cost of a zero-priced product, the amount of information extracted, and the adverts which take up their attention are in effect a cost to consumers... Enforcement should aim to ensure that where there are zero priced services, customers get the best possible quality and choice at the lowest possible cost in terms of information and attention.⁴⁹

The “digital dividend” describes the benefit firms obtain from harvesting data in online transactions. The digital dividend should be shared between consumers and firms, meaning the firm should not be allowed to extract all the value of the information from consumers. One way to do this is provide consumers with meaningful choices about the terms of trade with firms in the

⁴⁵ European Data Protection Supervisor, *Opinion on Coherent Enforcement on Fundamental Rights in the Age of Big Data* (23 September 2016).

⁴⁶ OECD, *Big Data: Bringing Competitors Policy to the Digital Era* (29-30 November 2016).

⁴⁷ NESTA, *Me, My Data, and I: The Future of the Personal Data Economy* (September 2017).

⁴⁸ EDPS, *supra* note 42 at 3.

⁴⁹ *Id.* at 13

marketplace. Meaningful choices entail allowing consumers to trade off price and data sharing in their transactions with digital sellers. Transparency of data policy is the key to providing meaningful choices by correcting information asymmetries between consumer and firms, especially large companies that “can rely on flows of information to price and risk management profiles in order to maximize their ability to extract surplus from consumers.”⁵⁰ Another way to cure such imbalance is to control agglomeration of companies through mergers and acquisitions. The Opinion recognizes and supports “greater scrutiny of proposed acquisitions of less established digital companies, which may have accumulated significant quantities of personal data that have yet to be monetized.”⁵¹

The OECD White Paper echoes many of the recommendations of the EDPS Opinion. One key difference is the OECD’s focus on big data as distinguished from the small-scale individualized data collected in traditional bricks and mortar transactions. Big data involves economies of scale and network efforts that tend to favor dominance in a platform. Competitive entry becomes difficult in the collection of big data: “As a result of such data-driven network effects,” the OECD concludes, “users may become reliant on the dominant platform even though they prefer a different platform model. For instance, while online users may prefer the privacy options promised by some search engines, the larger search engines provide better targeted results.”⁵² As a result, competitive dynamics leads to dominance and the difficulty of new entry. Against this market dynamics, the OECD also points to the need for closer merger review, especially when the acquisition of a company entails acquisition of big data, paralleling concerns of the EDPS. However, the OECD separately advocates the application of the essential facilities doctrine to provide better access to big data. The question of access is also critical for big data collected by the government. The OECD recommends broad access to public data in order to prevent the government from having an unfair advantage relative to private companies in competing in the digital marketplace.

Like the EDPS Opinion, the OECD report recommends greater protections for consumer privacy through transparency of contract terms, but also advocates for ownership rights over data and data portability by consumers. In addition to greater scrutiny of mergers and acquisitions involving big data, the OECD warns against the possibility of digital cartels through the sharing of big data. Collusive behavior as well as abuse of dominance is of critical concern in antitrust enforcement in digital markets.

Finally, the NESTA report identifies many of the same issues of data privacy and misuse set forth in the other white papers and discussed throughout this chapter. But the authors of the

⁵⁰ *Id.*

⁵¹ *Id.* at 7.

⁵² OECD, *supra* note 43 at 12.

report adopt a more decentralized consumer-oriented approach.⁵³ The report has consumers as the primary audience and urges them to take charge of their data. Consumer activism requires recognizing the data policies of various websites and Internet vendors and the need to be circumspect about what data is shared and with whom. Just as one solution to market dominance is consumer voice and joint activism in identifying and countering anticompetitive policies, so abusive information policies need to be taken out of the shadows by consumers. Online outrage with Facebook and Google policies is one example of such activism, which becomes effective through the work of educated consumers. The NESTA report serves an educational function.

Digital markets offer challenges for both theory and business practice. The next section turns to potential antitrust law and policy responses to failures in digital markets.

IV. Competition Policy and Law's Response

A tone of hesitation and qualification runs throughout this chapter, for good reason. The theories presented are novel and the applications are without direct factual precedent. A strong argument exists to rely on laissez-faire as markets develop absent strong empirical evidence of anti-competitive effects. However, waiting too long can result in economic harm that may be difficult, if not impossible, to correct. Caution may be wise, but an excess of caution is also troubling.

A point of potential common interest would be the best place to begin the antitrust prescription. Bork and many of his followers seem to agree with more progressive antitrust thinkers that the Supreme Court's 1951 decision, *Lorain Journal v. United States*,⁵⁴ was correctly decided. Discussed briefly in the second section, the *Lorain Journal* decision seems to provide some analogy for antitrust intervention in the digital economy because of the context of information markets. An established newspaper with clear market power refused to deal with advertisers who advertised with the new, up and coming radio station. At issue are competitive dynamics in an information market involving dueling platforms. In order for the radio station to compete, it had to cultivate a critical mass of advertisers. But the newspaper was concerned that it would lose a significant source of revenue if current advertisers switched to the new audio platform. Although some scholars have argued that *Lorain Journal* is about essential facilities⁵⁵, there is only a weak argument that either the radio platform or the newspaper platform is essential. Many of the advertisers might have had other channels if both platforms vanished. The Supreme Court's unanimous ruling against the newspaper, finding a violation of Section Two of the

⁵³ NESTA, *supra* note 44 at 6-7.

⁵⁴ *Lorain Journal*, *supra* note 16.

⁵⁵ See Robert Pitofsky et al., *The Essential Facilities Doctrine Under U.S. Antitrust Law*, 70 *Antitrust L.J.* 443, 462 (2002). An essential facility is a technology or infrastructure that firms in an industry need in order to operate. Dominant control by one firm of this technology or infrastructure may give to antitrust liability.

Sherman Act, which criminalizes monopolistic behavior, rested on a dominant firm using its strong market power (ninety per cent of the advertising market in Lorain, Ohio) to block an emerging and competing platform. Lorain Journal's actions are an example of the classic, and illegal, refusal to deal.

The precedent set by Lorain Journal has application to markets for competing platforms in digital markets. Agreements limiting searching on trademarked keywords can fit readily into the facts of Lorain Journal, especially if there are no business justifications for the restrictions. Protection of trademark rights may, as seems to be the case in the Contacts case, not be a legitimate business justification. However, some jurists read Lorain Journal as requiring a strong showing of specific intent to exclude in order to impose liability. In Lorain Journal, itself, there was evidence that the newspaper had as its primary goal the exclusion of the radio station from the market.⁵⁶ Many refusals to deal in digital markets may indicate mixed motives. Certainly in most competitive situations, a firm would like its competitors to go away. But such a motive would not transform a business transaction into an antitrust violation. One could make the case that the exclusionary conduct in Lorain Journal should be a strict liability offense. But then we are confronted once again with the fundamental problem: how intrusive should antitrust law be in the emerging environment of digital markets? While platform competition can lead to monopolization because of network effects, perhaps the consumer does benefit from this form of competition, especially if the monopoly effects are short term and contestable.

Khan advocates greater antitrust scrutiny of allegedly predatory conduct in digital markets. While traditional predation theories fail to show that a monopolist can recoup the lost profits from below average cost pricing, Khan points out that a monopolist in a multimarket setting, such as Amazon, can cross-subsidize below cost pricing in one market with normal or extra-normal pricing in other markets.⁵⁷ Furthermore, she seems to be arguing that antitrust enforcers, whether agencies or courts, should look beyond consumer-friendly pricing to example other terms of a contract that might impose hidden privacy and other information-sacrificing costs on consumers. This total transaction approach, meaning one that looks beyond price, would support more aggressive enforcement and intervention in the contract terms set by firms in digital markets. Khan's position would justify, for example, antitrust scrutiny of contract terms and business practices that compromise consumer privacy.⁵⁸

Stucke also recommends more antitrust scrutiny of digital markets although he is more cautious about aggressive intervention. Antitrust theories have to be more fully developed and digital markets, better understood.⁵⁹ But as the economic understanding improves, there seems to

⁵⁶ *Id.*

⁵⁷ Khan, *supra* note 3 at 791-2.

⁵⁸ *Id.* at 737-739.

⁵⁹ Stucke, *supra* note 4 at 27.

be a case for investigations into collusive behavior among firms in their use of algorithms and exclusionary unilateral conduct by dominant firms seeking to maintain dominance. Consumer benefits may arise in the aggressive competition of digital markets, Stucke seems to suggest, but these benefits might come at a cost to innovation and distribution.

One can conclude only on a cautionary note given the current state of the law and of economics. There is much to be concerned about, but also much to embrace in, digital markets. While antitrust doctrine needs to be reconsidered in the new market environment, so must intellectual property doctrine. Much of the structure of digital markets, the existence of network effects and the rise of dominance, can be traced to patent, copyright, and trademark laws that created a fairly wide scope of protection. How antitrust and intellectual property laws coordinate will be of continuing concern in digital markets. The Court's recognition that patent rights and antitrust conduct need to be assessed together in gauging reverse payment settlements extends beyond the specific context of generic drug entry. How the two areas of law need to be coordinated has been the subject of recent scholarship. What should not be forgotten is that competition in digital markets is the product not only of antitrust rules but also of the property rights that attempt to resolve the information externalities that arise in digital transactions.

V. Conclusion

Digital markets pose many tantalizing puzzles for scholars, practitioners, and policymakers. In such a dynamic setting, caution is perhaps the best advice. But caution should not imply deference and complete forbearance to laissez-faire markets. The competitive threats in the digital environment are real. However, the legal tools to meet the threats are still in the making. This chapter has documented the threats, but also set forth realistic paths for how antitrust and related doctrines can evolve to protect many interests in the emerging digital economy.⁶⁰

⁶⁰ For an example of the global context of digital markets, see Anupam Sanghi, 'Competition in the Digital Economy: How to Assess Emerging Tech Markets?' (2016) LexisNexis 3.