Regulation of Digital Platforms: A Survey of the Economic Literature

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This article reviews some of the notable economic studies on the regulation of digital platforms. I examine how economists view digital platforms as digital markets with an intermediary platform and then consider some studies that discuss the general challenges in regulating digital platforms. I conclude by looking at two papers that study specific issues in the regulation of digital platform in the net neutrality debate and the correct classification of workers that offer their services via online platforms.

Introduction

Some of the most pressing questions in regulation today—whether regarding the net neutrality debate or the correct classification of Uber drivers as independent contractors or employees—are related to digital platforms. This is unsurprising considering the growth of the use of digital platforms in our economic lives over the last two decades. This growth has been facilitated by the development of Internet and communications technology (ICT) during the same time period. We now use digital platforms for communication (for example, WhatsApp and Skype), travel (for example, Expedia), transportation (for example, Uber and Lyft), shopping (for example, Amazon), entertainment (for example, Netflix), accommodation (for example, Airbnb), and may even depend on such platforms for such essential services as electricity in the future.

Although not a comprehensive survey, in this article I discuss the economic studies on the regulation of digital platforms that I feel are some of the most relevant. The remainder of the article is arranged as follows. The second section explains how economists view digital platforms; the third section reviews papers on the regulation of digital regulation in general; the fourth section examines papers on digital platform regulation in specific sectors of the economy; and the fifth section concludes.

Digital platforms in economics

For identification purposes, the definition of a digital platform is of primary importance to regulators and competition authorities. However, there is no single agreed definition of digital platforms among economists despite the existing high-quality research in this area. Spulber (2018) argued that platforms are nothing more than digital markets, which suggests that the economics of markets and the economics of platforms are the same. Traditional economics has focused on production rather than transactions in the marketplace, but the immense success of online marketplaces such as Amazon and eBay and the online facilitation of the sharing economy such as Uber and Airbnb have encouraged the study the role of intermediaries in the market. According to Spulber (2018), the following terms have sufficient overlap to be treated equivalently in economic analysis: markets, platforms, intermediaries, market makers and match makers, market microstructure, organized exchanges, multi-sided markets, multi-sided networks, sharing economy and peer-to-peer markets, and ecosystems. Spulber called for a common terminology so that economic researchers can coordinate their research and avoid duplication of results.

With the increase in e-commerce since the beginning of the century, there have been a number of studies on the economics of platforms. The three seminal works in this area have been Rochet and Tirole (2003), Caillaud and Jullien (2003), and Armstrong (2006). All three theoretical analyses investigate the determinants of the prices charged by a platform to the two sides of the market they are intermediating. This provides an indication of where economists, especially those in the field of industrial organization, have focused their interest. It is, of course, important for regulators to understand how digital platforms set their prices if they are to be effectively regulated.

Rochet and Tirole (2003) derived pricing structures for a two-sided market with network externalities for a variety of different economic environments. The authors modeled a platform on which economic value is created when two sides of the market who are the end users of the platform—buyers and sellers—complete a transaction on the platform. Buyers and sellers are heterogeneous, and each agent’s surplus increases with the total number of agents on the other side of the market. Rochet and Tirole derived pricing formulae that the platform would implement for its usage on the two sides of market under different circumstances, including if the platform is a private monopoly, a social-welfare maximizer, competes with another platform, has buyers with linear demands, has buyers and sellers who

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can transact on multiple platforms (multihome), and can charge a fixed usage fee along with the price it charges per transaction.

Caillaud and Jullien (2003) analyzed a market in which there are two sides of a market that want to transact with each other, but have zero probability of matching unless they use an informational intermediary. Like Rochet and Tirole (2003), Caillaud and Jullien found that indirect network effects are present in the model in which each member of one side of the market benefits from using the intermediary if there are members on the other side of the market also using the intermediary on the other side of the market. This is because this increases the probability of a match for each member. The authors claimed that this is a representation of an e-commerce market. However, unlike Rochet and Tirole (2003), the populations on either side of the markets are homogeneous and the authors modeled the matching process explicitly. Caillaud and Jullien modeled two intermediary platforms that compete on price. One of the platforms is an established platform or an incumbent and the other is a new entrant. Caillaud and Jullien derived equilibria for a number of different cases, including when users can multihome and platforms cannot use transaction fees but have to rely on a single fixed registration fee. In all cases, the authors found that there always exist efficient equilibria, but that an inefficient equilibrium may exist in the multihoming case. This is important for regulators to know and identify because the main economic objective of the regulator is to maximize total welfare, which only occurs in efficient equilibria. An interesting result of Caillaud and Jullien (2003) is that when users can only use one platform (singlehome), the platforms’ profits are eroded by price competition as both try to capture the monopoly position. When multihoming is allowed, the platforms are able to avoid fierce price competition, leading to positive profits in equilibrium. Hence, it is possible that multihoming and the equilibrium in which platforms make a positive profit may not be an efficient equilibrium.

Armstrong (2006) also studied competing intermediary platforms that serve two sides of a market in which network externalities are present. He found that the price a platform charges to one side of the market is determined by how much the benefit the other side obtains from the presence of that side of the market. For example, some nightclubs grant free admission to women not because of the benefit (or lack of) that women enjoy from going to the nightclub, but because a larger female clientele increases the attractiveness of the nightclub to men. Therefore, to compete effectively on one side of the market, the firm needs to perform well on the other side. This leads to downward pressure on prices on both sides of the market in comparison to the case in which positive externalities are absent. Consequently, platforms have an incentive to decrease network effects. Another interesting finding by Armstrong is that if one side of the market singlehomes and the other side multihomes, then the multihoming side is forced to deal with the singlehoming agent’s chosen platform if it wants to interact with the agent. The platform becomes a monopolist in granting access to the singlehoming agents that choose to use it. In the case of a monopoly platform, this leads to high prices on the multihoming side which, in turn, leads to fewer agents being served on this side compared to the efficient outcome. When there are competing platforms, the profits earned from the multihoming side are largely dissipated in the low prices offered to the singlehoming side in order to attract them.

There has been substantial theoretical literature on intermediary platforms and two-sided markets following the three abovementioned papers. However, only a few studies have dealt directly with the question of the regulation of digital platforms. I discuss some of these studies in the next subsection.

General regulation of digital platforms

In this section, I discuss two studies that directly address the problems of regulating digital problems, and one study that sheds light on one of these problems.

Einav et al. (2016) analyzed peer-to-peer markets such as eBay, Uber, and Airbnb that allow small suppliers to compete with the traditional sellers of these goods and services. In their theoretical model, they found that, with a decline in fixed costs such as advertising and visibility allowed by the Internet, the capacity of small sellers may crowd out the dedicated capacity of traditional sellers. For example, the entry of small sellers of rental accommodation via Airbnb may cause Hilton to decrease its future investments. Einav et al. examined the main problems regulators face concerning digital peer-to-peer markets without offering any solutions. The first problem they cited is entry and licensing standards, whereby businesses such as Airbnb and Uber have managed to enter local markets by being able to dodge local regulations. Economically, escaping licensing may decrease welfare because licensing corrects market failures such as unlicensed taxi drivers operating unsafe vehicles. Conversely, licensing may only serve the interests of the incumbent operators such as taxi medallions that restrict entry into the taxi market (Stigler 1971). Hence, the entry of unlicensed new players may increase welfare. The second problem the authors noted is the use of contrac-
tors rather than employees that characterize peer-to-peer businesses. On one hand, some workers may value flexible working hours and demand variability may also favor this type of existing arrangement. On the other hand, market forces may not sufficiently protect workers and employment regulations are necessary. The third problem concerns data and privacy regulation. Peer-to-peer businesses collect data on their users for matching purposes, setting prices, and monitoring behavior. The question of which rights consumers and platforms should have regarding data is only partly an economic one. Nevertheless, Einav et al. believed that economic analysis is warranted in examining the role of regulating the sharing and use of individual user data. The last issue observed by those authors, which has not garnered much attention, is the question of when to regulate. A characteristic of a peer-to-peer business is that if it is initially successful, it grows exceedingly fast. Because regulations are difficult to change once they have been legislated, it may be wise to take a "lenient early-stage approach to regulation" (Einav et al. 2016). This is because a peer-to-peer business may transform into a very different organization than when it started, and early regulations may become ineffective or unreasonable. However, if regulators wait until a business has expanded, then later regulation may become a long and huge undertaking, given the large size of the business. An example of this is Europe's intended antitrust action against Google.

Montero and Finger (2017) were concerned with the consequences of digital platforms disrupting traditional network industries with physical assets such as the communications, transport, and energy industries. They argued that digital platforms disrupt traditional network industries in two ways: substitution and commoditization. Firstly, digital platforms such as Uber substitute for traditional industries such as the taxi industry. Secondly, commoditization entails the online platform obtaining a substantial share of the transaction’s value from one side of the market. For example, Skype provides voice over the Internet (VoIP) using the infrastructure provided by traditional telecommunication providers. The authors fear that these disruptions will cause underinvestment in network infrastructure by traditional service providers, which online platforms also rely on for the provision of their services. Montero and Finger then examined regulations in the communications, transport, and energy industries in this context.

One theoretical analysis that tries to examine investment by intermediaries was Spulber (2002), whose model was based on the business-to-business market. In Spulber’s model, buyers and sellers undertake complementary investments in their businesses. His main finding is that investment levels are efficient when there are two competing intermediaries in comparison to microstructures (1) in which there is no intermediary and buyers and sellers match randomly, (2) when there is a monopolistic intermediary and (3) when there is a simultaneous market of random matching and a monopolistic intermediary.

**Digital platform regulation in specific sectors**

I finish my discussion by mentioning two papers that investigate two single questions in the regulation of digital platforms in two specific sectors.

I believe that no particular issue has been more debated concerning digital platform regulation than net neutrality. The net neutrality debate is the question of whether Internet service providers (ISPs) should be able to price discriminate by charging content providers (CPs) higher prices for preferential access to broadband transmission service. One notable theoretical study on the net neutrality debate is Choi and Kim (2010). Choi and Kim studied the investment incentives of ISPs and CPs in the net neutrality debate. ISPs such as Verizon and AT&T oppose net neutrality regulations because they argue such regulations decrease their incentive to invest in network capacity. This occurs because such regulations mean that CPs supporting bandwidth-intensive multimedia applications will be charged the same price as CPs, causing less Internet traffic. The proponents of net neutrality (mainly large CPs such as Google and Yahoo and consumer rights groups) argue discriminatory pricing will stifle content innovation. Choi and Kim found that the direction of the relationship between net neutrality and the investments incentives of ISPs and CPs is not unambiguous. For example, capacity expansion of the network that speeds up delivery content of all CPs will decrease the value of preferential access (and hence, the price the ISP can charge for it) in a discriminatory regime. Thus, an ISP’s incentive to invest in capacity may be lower in such a regime than a regime in which it is forced to charge the same price to all CPs.

An interesting theoretical study is Hagiu and Wright (2018), which questioned whether workers that provide their services through online platforms such as Handy and Uber should be considered as independent contractors or employees. This is, to my knowledge, the first formal economic analysis on the welfare implications of the classification (and misclassification) of workers in the sharing economy. An interesting finding of theirs is that, in some situations, an intermediate classification between independent contractor and employee in which case the firm controls some of the actions of the worker while the
worker retains control of the remaining actions may be welfare-maximizing.

Concluding remarks

Although this has not been a comprehensive survey, it should be clear that legislators and regulators are faced with myriad new challenges in the regulation of digital platforms in general, as well as in specific sectors of the economy. With technology progressing in leaps and bounds as it has been for the last two decades, these challenges are predicted to increase. Compared to these growing challenges, there has been a dearth of economic research in this field. Hopefully, this will change in future, with more economic theoretical and empirical research on this subject, which is so desperately needed to guide regulatory policy.

References


