The Emergence of Platform-Dependent Entrepreneurs: Power Asymmetries, Risk, and Uncertainty

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ABSTRACT

Digital platform firms are among the most valuable in the world due, in large part, to the ecosystems of complementors that have emerged around them. We explore the contradictory impact that platforms have on entrepreneurship. The ecosystem metaphor used to describe the network of interdependence among the members is intrinsically flawed because it obscures the godlike powers of the platform owners. In fact, complementors are platform-dependent entrepreneurs (PDEs) whose businesses and existence are largely determined by the platform owner. We show that digital platforms ease entrepreneurial entry by lowering entry costs and providing boundary resources to attract and support complementors. Yet businesses dependent upon digital platforms are extraordinarily precarious. The reasons for this precariousness include the extraordinary visibility that platform owners have over all participants and an ability to unilaterally change the terms and conditions of participation, even become a direct competitor to entrepreneurs who are dependent upon the platform. We describe the limited strategies that PDEs can use in an attempt to mitigate their dependence. We suggest that the relegation of entrepreneurs to dependence requires a new way of thinking about entrepreneurship as platforms continue their march to centrality in the global economy.
“The court (platform) maintains its power by remaining secretive about its operations. And since it is accountable to no one except itself, it does not have to make its actions public.”

“Since the court (platform) is a closed system that operates on its own rules, and since the court's (platform’s) power is so absolute, it is effective at rebuffing any effort from outsiders (complementors) – including ambitious defendants (complementors) – to penetrate its mysteries.” (Apologies to Franz Kafka)

1. Introduction

Digital platforms such as Amazon, eBay, Etsy, Google search and advertising, Instagram, and YouTube make it easier than ever for entrepreneurs to build a business and generate income. Yet, for entrepreneurs building businesses on the platform—that is, the “complementors”—any misstep, many of which can be identified by the all-seeing algorithms, can lead to summary judgment followed by Kafkaesque adjudication. Today, both entrepreneurs and existing businesses must navigate a world in which customers want to make their purchases online, so an online presence is necessary. As a result, participation in a platform’s ecosystem has become vital for their existence and growth (Kenney & Zysman, 2016; Parker et al., 2016). The economic centrality of platforms heralds a new reality for entrepreneurs.

At least since Joseph Schumpeter, it has been recognized that entrepreneurs discover and create opportunities and build new independent firms (Alvarez & Barney, 2007; Audretsch, 2007). More recently, scholars such as Brynjolfsson and McAfee (2014) have hailed entrepreneurship as a vital response to the increasing concerns about digitization’s impact on the future of work. Academics studying platforms have emphasized the importance of platform complementors in providing variety and innovation to generate a platform’s “ecosystem” (Boudreau & Lakhani, 2009; Parker et al., 2016). While recognizing the tremendous new business opportunities created by online platforms, we differ from many others in arguing that enterprises dependent upon a platform are not independent, in the traditional sense, but, rather, can be better understood as “platform-dependent entrepreneurs (PDEs).” We explore
the profound impact that the “platform economy” has upon the enormous number and variety of entrepreneurs (Aldrich & Ruef, 2018).

The broad shift in business-to-consumer activity online has led to a fundamental alteration in power, to the point that the digital platforms intermediating economy activity have transformed the market. As a result, vast reaches of the economy are being (re)structured by platform firms. Entire constellations of producers, sellers, and even specialized service providers have emerged around the largest platforms. Even firms that are not directly running their business on digital platforms are affected by online services such as Google search and ranking algorithms, to the point that for many firms, not appearing in Google search results is tantamount to nonexistence. In large measure, the study of the impacts of platforms has concentrated on labor platforms, such as Uber (e.g., Cramer & Krueger, 2016) or Upwork (Popiel, 2017), crowdfunding (Sorenson et al., 2016), and retail (Khan, 2016). Despite its transformative impact, the implications of the platform economy on entrepreneurs has been studied less (for a few exceptions, see Nambisan, 2017; Sussan & Acs, 2017; Autio et al., 2018). Of course, platforms such as Amazon, eBay, Etsy, Facebook, Google, Lyft, and Uber are the result of venture capital–funded entrepreneurs. However, as Aldrich and Ruef (2018) demonstrate, these venture capital–financed entrepreneurial successes make up only a fraction of all entrepreneurial activity. Whereas studies have been conducted regarding the impact of digital platforms on entrepreneurs and the entrepreneurial process, most have been laudatory or have not considered the impact upon the businesses that have become dependent upon the platform.

This article explores the contradictory impact of platforms on entrepreneurship (Nambisan, 2017; von Briel et al., 2018; Autio et al., 2018). We show that the entrepreneurial process, which is already characterized by high risk, is both eased and made more precarious by being dependent upon a platform. The precarity is increased as the venture is vulnerable to unilateral, largely irresistible, and often unappealable decisions made by platform owners for their own benefit. PDEs face risk that is
incalculable as the platform has godlike powers ranging from complete visibility into the PDE’s business to an ability to unilaterally change the terms of participation, up to suspension and removal from the platform, which results in a loss of any and all equity that the entrepreneur has created (Zuboff 2019). As a result, PDEs suffer not only the normal risks and anxiety that come with building a firm but great uncertainty due to their dependence upon the platform. As part of examining the phenomenon of the creation of the PDE, we explore the pitfalls of using the ecosystem metaphor to describe the economic space created for complementors.

The paper begins by defining platforms and discussing their role in entrepreneurship. We then critique the ecosystem metaphor as fundamentally misleading about the true nature of the relationship between the platform and its complementors, though we continue to use the terms “ecosystem” and “complementors.” Section 4 describes the resources that the platform provides to members of its ecosystem and sets the bases for unraveling their dependence. Section 5 introduces the concept of PDEs and describes the powers that the platform owner wields over those in the ecosystem, arguing that entrepreneurship in such an environment is fundamentally different than normal concepts of entrepreneurship. In section 6, we describe some of the strategies that PDEs have developed to resist platform power. The discussion and conclusion explore the implications of our results for understanding entrepreneurship today.

2. Entrepreneurs and Platforms

Platforms have been defined in a variety of ways (Baldwin & Woodward, 2009; Parker et al. 2016; Evans et al. 2006). We adopt Gower’s (2014, p. 1240) definition “that platforms are evolving organizations or meta-organizations that: (1) federate and coordinate constitutive agents who can innovate and compete; (2) create value by generating and harnessing economies of scope in supply or/and in demand side of the markets; and (3) entail a modular technological architecture composed of a
core and a periphery.” Our discussion is confined to online software platforms because they have powerful generative potential—that is, they enable the creation of new output, structure, or behavior, often without direct input from the system originator (Zittrain 2008). This is accomplished by the provision to platform users of various social and technical boundary resources (Ghazawneh & Henfridsson 2013) that attract complementors to join and thereby constitute its ecosystem (Jacobides et al. 2018). Although it is true that complementors join a platform’s ecosystems for various reasons (Boudreau & Jeppesen, 2015; Jeppesen & Frederiksen, 2006), the contributors of interest to us are those who do so with entrepreneurial intent.

The platform business model has demonstrated such disruptive power that many platform firms are among the world’s most valuable corporations (Moazed & Johnson, 2016). The forthcoming initial public offering for digital firms such as Uber, Slack, and Airbnb indicate that in a few years digital platforms might organize even more parts of the economy, with even greater implications for entrepreneurs and entrepreneurship as a practice.

Digital platforms facilitate and simultaneously shape the emergence of novel entrepreneurial opportunities. When conceptualizing the emergence of entrepreneurial opportunity, it is important to consider the role of contextual elements or enablers such as “single, distinct, external circumstances, which—by affecting supply, demand, costs, prices or payoff structures—can play an essential role in eliciting and/or enabling a variety of venture development attempts” (Davidsson, 2015, p. 684). Although contextual elements operate at the environmental level and can be actor independent, particular actors often influence or even have a central role as external enablers (Davidsson, 2015). By orchestrating entire ecosystems of value creation and exchange (Nambisan, 2017) and by providing resources for various stages of the entrepreneurial process (von Briel, Davidsson, & Recker, 2018),
digital platforms not only are external enablers but also open new spaces where entrepreneurs can create new firms.\(^1\) Effectively, they become the context for entrepreneurial activity.

Platform-based entrepreneurs may deviate from the stereotypical Silicon Valley high-growth startups and are often more mundane retail or service businesses (Barley, Bechky, & Milliken, 2017). These enterprises have great variety: opening a knitwear shop on Etsy, eBay, or Amazon, creating a YouTube channel, writing apps, creating a reselling business on Amazon, starting a business based on Google advertisement referrals are only some of the types of businesses that can be established on a digital platform (Haefliger, Jäger, & Von Krogh, 2010; Keinan et al. 2015; Kim, 2018). This enormous population of entrepreneurs is largely unstudied, as scholars have focused on the platforms. This omission is noteworthy considering the sheer number of these entrepreneurs (Table 1 shows the number of entrepreneurs operating on the major platforms)

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\(^1\) Joseph Schumpeter theorized that new technologies or other market changes could open new economics spaces to be occupied by entrepreneurs who construct new business models capable of exploiting the opportunities.
<table>
<thead>
<tr>
<th>Platform</th>
<th>Date established</th>
<th>Description or major activity</th>
<th>Revenue 2017/18</th>
<th>Number of entrepreneurs 2017/18</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple iOS/App Store</td>
<td>2008</td>
<td>Marketplace</td>
<td>$46.6 billion</td>
<td>2 million apps</td>
<td>Wikipedia</td>
</tr>
<tr>
<td>Amazon*</td>
<td>1995</td>
<td>Marketplace</td>
<td>$42.8 billion</td>
<td>About 100,000 sell more than $100,000 per year, 2 million total</td>
<td><a href="https://www.entrepreneur.com/article/303532/">https://www.entrepreneur.com/article/303532/</a></td>
</tr>
<tr>
<td>YouTube</td>
<td>2005</td>
<td>Video sharing</td>
<td>$8.2 billion</td>
<td>40,000 full-time creators, 12 million channels</td>
<td><a href="https://medium.com/@Morjax/how-many-youtube-creators-could-be-full-time-6ecd1636bfc1/">https://medium.com/@Morjax/how-many-youtube-creators-could-be-full-time-6ecd1636bfc1/</a></td>
</tr>
<tr>
<td>Shopify</td>
<td>2004</td>
<td>Software for online sales</td>
<td>$673 million</td>
<td>600,000 merchants</td>
<td><a href="https://en.wikipedia.org/wiki/Shopify/">https://en.wikipedia.org/wiki/Shopify/</a></td>
</tr>
</tbody>
</table>

* Amazon Marketplace third-party revenue
The preponderance of research on entrepreneurship focuses on extraordinary firms that are described as *gazelles* and *unicorns*, rather than studying the far more common, ordinary entrepreneurs (Aldrich & Reuf 2018). The dearth of research on entrepreneurs on digital platforms is even more problematic considering that essentially all entrepreneurship today is predicated upon being in a platform ecosystem. For example, the sale of consumer goods has been transformed by Amazon. Amazon and other digital platforms are where consumers learn about and search for goods (Dennis 2017). The growing centrality of platforms is evidenced by the need for even the most powerful established brands to establish a presence on Amazon: Nike and Apple had resisted selling through Amazon in part out of fear of undercutting their existing vendors, but in 2018, they capitulated and began selling on Amazon (Galloway, 2018; Kelley, 2018).

To appreciate the impact of the platform economy, it is important to explore how entrepreneurial activity changes in the context of a platform ecosystem. The character of entrepreneurship depends on the context, which has its own rules, threats, and opportunities (Autio et al., 2014). In addition to market rules, which are a common factor regulating economic dynamics, other contextual features can facilitate, hinder, or have contradictory impacts on entrepreneurial success—for instance, the presence of venture capital locally or legal structures such as the existence of noncompete agreements (Marx et al., 2009).

Section 3 addresses the commonly adopted ecosystem framework and explains why it suffers from a conceptual flaw that conceals the dependent nature of entrepreneurial dynamics in platform-organized markets.
3. The Ecosystem and Complementor Metaphor: Concealing Dependent Entrepreneurship

The ecosystem metaphor was adopted in business in the 1990s and has become remarkably popular (Jacobides, Cennamo, & Gawer, 2018; Moore 1993). In ecology, an ecosystem is defined as an interdependent collection of plants and animals or a structured system of communities governed by general rules (Chapin et al. 2002). This definition was extended to economic activity to describe how spatially proximate interdependent organizations interacted to create mutually shared benefits, and, early on, it was introduced to describe the Silicon Valley industrial system (Bahrami & Evans 2000). This kind of situation has no organizing entity determining the rules of engagement for the other participants or with the power to unilaterally exclude, change the terms of engagement, or absorb the functions of other ecosystem actors.

To conceptualize the interdependence between the actors involved, their shared destiny and the complex architecture of their interactions, the literature on digital platforms adopted the concept of an ecosystem (Iansiti & Levien, 2004a; Tiwana, Konsynski, & Bush, 2010; Gawer & Cusumano, 2014). The literature recognizes the prominent role of the ecosystem’s “keystone” firm (Iansiti & Levien, 2004b, which are responsible for the viability of an entire ecosystem. In another context, it would be laughable to suggest that lions in a savannah can decide to expand their role to displace gazelles or require dung beetles to change their operations—or, in a sociological setting, such as Silicon Valley, that venture capitalists could decide to become law firms or unilaterally dictate that the contract-writing function of law firms be ceded to venture capital firms. In contrast to these environments, in the business
ecosystem, the platform owner wields enormous asymmetric power over other “ecosystem” members.

The literature nearly always postulates that the complementors and platform owners in these ecosystems share similar objectives in relation to the value proposition to customers (Jacobides et al., 2018; Nambisan & Baron 2013). Wareham et al. (2014, p. 1198) refer to complementors as “autonomous actors, act as entrepreneurs, invoking the speed of market mechanisms while focusing their own portfolio of domain expertise, sector knowledge, and relational capital to create locally relevant solutions.”

This collaborative image in which platform owners and autonomous complementors “depend on each other and share a common fate” (Tiwana et al. 2010, p. 52), with a flat power structures between the actors allows successful platform owners to have “hundreds if not thousands of partners [that] also participate in platform-based ‘ecosystem’ innovation” (Gawer & Cusumano 2014, p. 417). These authors do not reflect upon what “partnership” means in markets controlled by a platform with the power to determine the rules of engagement or to unilaterally punish or even exclude its partners.

A platform owner, like all businesses, is interested in profits. They are able to “impose rules and constraints, create inducements and otherwise shape behaviors” (Boudreau & Hagiu 2009, p. 3). According to Nambisan & Baron (, 2013, p. 1073), the other ecosystem actors must “surrender part of their autonomy and independence” to align their businesses with the desires of the platform leader (Tavalaei & Cennamo, 2018) – in some cases, this can so far as to surrender their business. An example of the ambiguity surrounding these ecosystems is that scholars recognize that platform owners can and do absorb the businesses of their complementors and identify the different motivations behind platform owners’ decisions to
compete against and often destroy their complementors (Gawer & Cusumano, 2002; Gawer & Henderson, 2007; Zhu & Liu, 2018). For them, the decision to absorb or eliminate their complementors’ businesses is portrayed as a mechanism to defend the ecosystem, aimed at exercising better quality control (Zhu & Sun, 2018) or at stimulating innovation with a better customer experience (Gawer & Cusumano, 2002). In contrast to these benign interpretations, Zhu and Liu (2018) confirmed that Amazon entry patterns into market segments created by independent merchants are aimed at appropriating the value of its most successful complementors.

Because platform owners can impose rules, boundaries, and directions, complementors bear the risks of entrepreneurship, while lacking the freedom and independence typical of an independent business (Nambisan & Baron, 2013). Scholars studying digital platforms have mostly embraced an ownership perspective to look at the strategies and the dynamics put in place to generate and maintain value in the ecosystem (Gawer & Cusumano, 2002; Gawer & Henderson, 2007; Boudreau, 2010), hence the issues faced by complementors are under-investigated (Tavalaei & Cennamo, 2018). The effect of these power dynamics on the myriad small complementary businesses is explored only in passing.

We have indicated that the “ecosystem” metaphor is problematic, and yet it is not entirely incorrect. Recognition is growing among scholars that more research should be devoted to the members of business ecosystems (Kapoor & Agrawal, 2018). Platforms provide their ecosystem members with significant resources, which we discuss in the next section, because paradoxically these resources give the asymmetric power to the platform owner who has an omniscient view and the ability to unilaterally expel any complementor or customer, and change the rules that govern the community.
4. Entrepreneurs, Complementors, and Resources

Joining a platform ecosystem as a complementor by definition means acceptance of the goals and general value proposition of the platform owner (Nambisan & Baron, 2013). To be successful, a digital platform requires complementors and consumers to populate its ecosystems. Therefore, platforms provide all kinds of incentives to join their ecosystem. All things being equal, the higher the number of complementors, the more robust the platform is and higher the total value created in its ecosystem (Gawer & Cusumano, 2014). Of course, as Boudreau (2012) finds, there may be a limit to the number of complementors able to join a platform ecosystem. To attract entrepreneurs, platform owners must provide access, opportunities, resources, and even subsidies because the provision of tools lowering the costs of connecting to the platform and accessing customers encourages platform adoption. In the economics literature, these resources are considered subsidies (Boudreau & Hagiu 2009). In this section, we enumerate the most salient resources used to attract entrepreneurs and introduce complementary services.

4.1. Customer Access

For entrepreneurs, the fundamental benefit is access to potential customers—i.e., the platform’s matching function. Taking advantage of connectivity, they reduce costs of discovery and transaction. This is true whether it is a market platform or an advertising-supported platform. The scope of these markets ranges from global (online sales) to extremely local (locating a Lyft driver), and the scale can be tremendous. For example, in 2018 the Etsy marketplace hosted more than 2 million vendors and approximately 40 million buyers (Etsy &
GfK, 2017). In this case, Etsy allows entrepreneurs who join as complementors access to customers globally. By aggregating large numbers of users and including ranking and search functions, they make discovery of this far-flung sellers on the possible, thereby creating new spaces for entrepreneurs.

4.2. Access to Resources

All new ventures typically require a variety of resources, including capital, skilled workers, networks, and customers, to overcome the liability of newness (Stinchcombe, 1965). Platform ecosystems are organized to attract entrepreneurs by providing access interfaces, templates, manuals, and other technical support, either gratis or at very low cost. Moreover, platforms must develop and offer these resources, even when they lose money because they are dependent upon attracting complementors. Because these resources are meant to facilitate complementary product development, they lower entry barriers (Nambisan, 2017; Nambisan, Siegel, & Kenney, 2018). In Table 2, the variety of resources offered by Etsy are listed and described.

<table>
<thead>
<tr>
<th>Services</th>
<th>Free or Paid</th>
<th>Type of service</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application programming interfaces (APIs)</td>
<td>Free</td>
<td>Auxiliary</td>
<td>Etsy APIs allow the creation of apps to manage listings, analyze sales history and feedback, control shop appearance, and access certain customer information. In 2019, 70 APIs were available on the website.</td>
</tr>
</tbody>
</table>
Educational resources, such as articles, webinars, and posts that teach sellers how to start, manage, and scale their Etsy businesses. They focus on taxes, shipping, and marketing, with updates every week.

Educational program for underserved communities.

Dedicated system provided by Etsy to streamline payments for sellers and buyers.

Online videos to improve sales.

Advice, discussion of changes, etc.

Information on traffic, listings, and customers.

The scale of investment in these resources to lower entry barriers and facilitate the complementor’s business can be enormous, as it includes engineering for application programming interfaces (APIs) and data analysis, marketing and sales information, training, and other resources. Platforms such as YouTube have permanent facilities (YouTube spaces) in key cities globally. These co-investments with their complementors create sunk costs and lock-ins that increase the dependence of the entrepreneurs who use them.

4.3. Platform-Derived Complementor Legitimacy

Because of their anonymity, digital transactions are marred by an inherent lack of trust between parties that do not know each other and whose transactions are unlikely to be repeated (Jøsang et al., 2007). Complementors benefit from the systems that platforms have put in place to address this fundamental fact. The first and most widely recognized feature for
increasing trust is seller and buyer ranking and commenting systems that provide ex ante information from previous users to both transaction parties. Moreover, ranking systems can be used to monitor and discipline ecosystem members. The second feature for overcoming a lack of trust is that the platform uses both algorithmic and human curation to identify dishonest or undesirable listings, such as counterfeit products on sales platforms or copyright violations on YouTube.² The third feature is customer service representatives who make the final decision in a dispute resolution. Together, these features provide platform entrepreneurs with legitimacy and value and facilitate transactions.

4.4. Lower Opportunity Costs

Opportunity costs are an entry barrier for entrepreneurs (Amit, Muller, & Cockburn, 1995). In the case of digital platforms, these barriers are often very low. For example, new entrants can begin with part-time activities, and many YouTubers began in their bedroom or dorm room, and eBay sellers began by selling miscellaneous items. Many anecdotes have circulated about how amateur activities evolved into full-time professional businesses (Demetry, 2017; Kim, 2018), and, as we described earlier, the platform actively provides resources to encourage such activity.

The success of a digital platform is predicated upon attracting users and complementors. It does this by lowering entry barriers and reducing risk, and, when successful, they foster ecosystems where entrepreneurs become the platforms’ complementors (Eckhardt, Ciuchta, & Carpenter, 2018; Nambisan et al., 2018). The eased entrance into the ecosystem has the contradictory effect over time of creating a lock-in effect due to the asset-

² We are not arguing that they are flawless, only that they exist and provide some reassurance regarding the bona fides of the product.
specific nature of the investment and the lack of portability of the cumulative investment by the complementor in terms of reputation, transaction history, and repeat customers. The next section explores the features of a platform that transform entrepreneurial activity from an assertion of independence to a state of dependence.

5. Mechanisms for Creating Dependence

Entrepreneurs establishing their business on a platform face a fundamentally different context (Autio et al., 2014) from traditional entrepreneurs who establish firms in the physical world. To attract them, the conditions for engagement must be attractive—often so attractive that the platform will lose money to achieve lock-in. This is particularly the case when the entrepreneurs must make significant asset-specific investments, which integrate the PDE into the platform’s ecosystem. The higher the investment is (often it is cumulative), the greater is the dependence on the platform. Ceteris paribus, the more successful entrepreneurs are on a platform, the more dependent they are.

All entrepreneurs face challenges, those who build a business on a platform face unique risks that emanate from the platform. In a recent study, Wen and Zhu (2018, p. 16) found that app developers responded to Google’s threat of market entry and subsequent competition with their app by undertaking “no entry deterrence behavior, such as price reduction and additional innovation . . . because of the platform owner’s power, its entry is unlikely to be deterred.” This response suggests that they understood that resistance was futile. In this section, we describe the characteristics of platform-based markets that contribute to this competitive asymmetry.
5.1. Platform as Panopticon

The platform owner has a God’s eye view of the activities of other ecosystem participants (Boudreau & Lakhani, 2009). The term “asymmetric information access” underestimates this power (Shapiro & Varian, 1998). The platform not only can observe all the activities but also decides which information is given to the complementors. In multisided platform markets, the owner rations the specific information to the various sides—all of which is optimized for the benefit of the platform owner.

This power is illustrated in an interview with a former Amazon employee who stated that it retained “the most valuable data for itself; provides less valuable data to marketplace sellers.” The employee continued that the “most valuable info Amazon doesn’t share is info about which people have searched for a particular product in the past.” This allowed Amazon to “target their private label products with perfect precision” (Capitol Forum, 2018). On these platforms, the DE only has the knowledge about the customer that the platform provides. The ability to see all activities on the platform, while providing only carefully selected data to the complementors (and customers) ensures the platform owner maximum leverage.

5.2. Entry to the Dependent Entrepreneur’s Business

The platform is central to all interactions and has the ability to direct traffic. This centrality and the panoptic endowment enable the platform to identify vendors or market segments that are particularly lucrative. This, combined with the centrality of the platform, allows the introduction of a competitive product or the establishment of a “tax” to appropriate the surplus. For example, when threatened with the potential for the browser to be a new killer application, Microsoft destroyed the new entrant, Netscape, and its business model, by introducing Internet Explorer, which was bundled into the operating system (Yoffie &
Cusumano, 1998). Microsoft effectively leveraged the Windows operating system to absorb functions developed by its ecosystem member, Netscape (Eisenmann, Parker, & Van Alstyne, 2011). The platform owner may not always be successful in absorbing the functions of complementors. To illustrate, Intuit was the target of acquisition by Microsoft, which was blocked in doing so by the Department of Justice on antitrust grounds, so Intuit was able to resist this attempt and remained the market leader in consumer accounting software (Newman, 1997). Moreover, compared to the PC era where platforms like Microsoft dominated the scene, online digital platforms have even greater visibility into their ecosystems. For example, Amazon can identify independent third-party vendors whose products sell well in its marketplace, examine the product, and decide whether the profit margins are attractive (Zhu & Liu, 2018). It can then enter the market through its 136 private label brands and 373 exclusive brands (TJI, 2019). This process was described by a former employee:

Let’s say Amazon wants to get into folders. I would find all of the ASINs [Amazon Standard Identification Number] that are being sold on the website now. I’d pull up the history. I’d look at the volumes, price points. Regardless of whether it was sold wholesale or third party, I’d pull it all together. I’d look and see what’s the hottest product. What’s the hottest variation in color? We’d have these folders in these colors at this price point, and we’d go off and make it ourselves. (Capitol Forum, 2018, p. 3)

Dominant platforms can survey activities on their platform, research the opportunity, and decide whether it is economically viable to enter that specific market—whether it was pioneered by an entrepreneur or an established firm. Thus, a business built by a DE is vulnerable to expropriation without recourse.
5.3. *Input Control*

As the ecosystem curators, platform owners must manage their complementors in the ecosystem—a necessity to prevent the platform ecosystem from becoming dysfunctional (Thies, Wessel, & Benlian, 2018; Jacobides et al. 2018). On all platforms, input control ensures that complementors abide by the terms and conditions for participation (Tiwana 2015, 2014). Although this is not the typical principal-agent problem, it has similarities. Input control is a vexing issue for DEs because on consignment-based platforms the content-creation investment must be made before the product (often digital) is accepted for sale/distribution. Because the platform may change acceptance criteria at any time and without warning, the DE’s business model is precarious. For example, recent decisions by Google, YouTube, and Facebook to demonetize, ban, or demote various websites are based upon a change in direction in which content should be allowed. Because platform-organized markets are largely winner-take-all, the DE’s products cannot simply be shifted to another market as often only one market exists.

5.4. *Changing the Terms of Participation*

The decision to enter a market is based upon understanding the operative rules for participation. In an offline business, the most salient terms are leases, supplier and customer relationships, and government regulation. To participate on a platform, users must agree to the terms and conditions. One key clause in all of them is that they can be changed unilaterally at the discretion of the platform owner. Terms of participation have two components: first, “hard” components that are the core of the platform, i.e., the software or algorithms, including the software development kits (SDKs) and application programming interfaces (APIs). These are boundary resources given to the complementors. Second, “soft” components, such as rule
changes, are included in the platform’s contractual terms and conditions. These rule changes can jeopardize not only the profits but also the survival of the complementor’s business (Nambisan, 2017).

The price of a product and the entrepreneur’s profit margins are existential decisions and fundamental to being an entrepreneur. For entrepreneurs using a digital platform, issues such as the share of revenue accruing to the platform and the complementor is invariably set solely at the platform owner’s discretion. To illustrate, in fall 2018, eBay unilaterally announced an increase in its commission fees in the Books, DVDS, and Movies categories to 12%, while removing the fee discount that eBay Store owners enjoyed (Steiner, 2018). Even prices may be set by the platform. For example, for self-published books in the Kindle marketplace priced from $2.99 to $9.99, Amazon pays the author 70% of the retail download price, but only 35% for those priced above or below this range. Amazon arbitrarily forced its complementors to accept its preferences.

5.5. Platform Access

Platform owners act as private regulators who are expected to reduce negative externalities created by complementors in order to maximize the value for the system as a whole (Boudreau & Hagiu, 2009; Evans, 2012). The profit of the platform owner and the value of the ecosystem are directly linked, and insufficient control over opportunistic behaviors by “complementors” may degrade the ecosystem and even result in the platform’s failure (Täuscher & Kietzmann, 2017). Platforms thus are strongly incentivized to perform their regulatory role, and they can rely on a large set of enforcement instruments, including exclusion (Strahilovetz, 2006). Although exclusions can be for bad behavior (Evans, 2012), they can just as easily be “distorted away from pure value creation in the ecosystem towards
actions that lead to higher platform profit” (Boudreau & Hagiu, 2009, p. 8). Platform owners are meant to be a neutral or, at least, a trusted party. For example, Apple agreed to sell on Amazon; the quid pro quo was that the unauthorized independent Apple resellers had their listings removed (Kelley, 2018). The mechanisms required to protect the ecosystem can be used for exclusion to pursue other goals that advantage the core firm. The risk of anti-competitive exclusion poses a threat to any entrepreneur using a platform.

5.6. Complementor and Customer Relationships

For a platform to be an intermediary, the vendor must be separate from the customer. The DE depends upon the platform to maintain the connection, and, if the entrepreneur loses platform access, then the customer access is also lost. To illustrate, YouTubers actively cultivate their community by interacting with their fans to build their followers. When YouTube blocks creators, they immediately lose access to their fan base and have no way of contacting them to move their customer base to a new platform. eBay uses machine learning to identify violations of its policy forbidding the exchange of contact information between buyers and sellers (Meldner 2017).

The separation of providers from customers is normal for most platforms. For example, in 2019 Apple launched Apple News+, a magazine and newspaper subscription service on which publishers could provide their content to Apple, which would then aggregate and provide it to Apple users for a $10 per month fee, of which Apple would retain 50%. This service separates publishers from their readers (Sloane, 2019). Most importantly, once established, this separation would be difficult to reverse. Separation from one’s customers gives “ownership” of customers to the platform. After the platform owns the customer, it can
unilaterally set the conditions for customer engagement. The ownership of the customer shifts enormous power to the platform owner.

5.7. *Ranking Systems as a Control Mechanism*

Ranking systems are essential features of many platforms because they function as mechanisms to foster trust, identify lower prices, and direct traffic (Jøsang et al., 2007). As such, ranking systems can aid discovery and reduce transaction uncertainty (Tadelis, 2016). Further, ranking is correlated with click-through behavior (Ghose et al., 2014), and users are more likely to select a higher-ranked item—whether in search results or a ranking system. Ranked scores can be used to discipline complementors. They can directly influence customer preferences: Luca (2011) found that a one-star increase in a Yelp rating led to a 5-9 percent increase in a restaurant’s revenue and visibility.

The power of the ranking systems derives from the fact that those doing the ranking are most often anonymous, and the platform makes it difficult to appeal negative rankings. Equally important is that the algorithms generating the rankings, the data, and the weighting system are invariably opaque. It is in the platform owner’s best interest not to reveal the algorithms so as to prevent manipulation and opportunistic behavior. A veneer of objectivity can conceal the platform’s agenda, which can be designed to provide results that are beneficial to its goals. As a result, the ranking system and changes can in it appear to be capricious (Scott & Orlikowski, 2012). Because these algorithms are proprietary and evolve over time, complementors’ only avenue for recourse is to appeal to the platform owner.

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3 In China, where interpersonal trust among those outside one’s personal networks is particularly low, Alibaba’s innovation was to hold the payments in a trust account until the purchaser accepted the product and authorized payment.
5.8. Business Suspension

Complementors’ access can be suspended for any activities deemed to be an infraction of the rules (which, as mentioned earlier, can change with no prior notice). Often, this suspension is governed by algorithms that constantly monitor activities on the platform. But algorithms and even people can be wrong, and thus access may be unjustifiably interrupted. In some cases, infractions reported to the platform may actually be the product of unethical competitor behavior (Luca & Zervas, 2016; Woollacott, 2017).

For a DE, suspension has immediate financial repercussions. There is no possibility of immediate appeal, and the platform need not provide sufficient information to understand the reasons for suspension. In a Kafkaesque scenario, DEs are forced to appeal a decision that was made for unexplained reasons. The frequency of sanctions on platform entrepreneurs has grown to the point that some consulting companies now specialize in dealing with platform decisions (Dzieza, 2018) and firms such as InsuraTech offer insurance to cover lost sales and additional costs triggered by a suspension—and, of course, all these costs are borne by DEs.

5.9. Concluding Thoughts

For entrepreneurs, platforms have a contradictory character. First and particularly initially, platforms offer DEs many resources. In return, platforms benefit from their innovations and entrepreneurial effort, which attract users, and often the platforms share in the income produced. As these platforms and ecosystems grow and mature, the importance of the individual complementor decreases. Platform owners are running a business, so they seek to increase revenues and profits. Figure 1 shows a stylized representation of this process, in which non-DEs will have greater difficulty and higher cost in entering the market because they have to produce or secure access to resources that a platform provides. However, assets
such as reputation and customers belong to non-DEs, who neither benefit from a platform nor are immediately vulnerable to its decisions. Thus, as the business of non-DEs matures, they face fewer risks than platform complementors.

Figure 1: A Stylized Representation of the Risk Profile of a Non-Platform-Based and Platform-Based Entrepreneurial Firm

6. Responses of Dependent Entrepreneurs

DEs understand their status and have developed responses, the most salient of which are described in this section. Most of these activities are problematic because they take place within the ecosystem of a platform that controls the nexus of communication and has a vested interest in ensuring the failure of such activities to create countervailing power. Given the platform’s omniscient view of activity, detection of DE responses meant to weaken the
platform’s power elicit a powerful counter attack by the platform, and DEs normally have little recourse. Their responses, however, deserve greater study.

6.1. Multihoming

Multihoming refers to DEs’ ability to offer their product or service on multiple platforms (Kenney & Pon, 2011). Multihoming comes with a cost, as the entrepreneurs must customize their offering to each platform’s specifications. Multihoming can increase platform entrepreneurs’ power, though, because of network effects, the platforms often are either monopolies or oligopolies—as is the case with smartphones, ride sharing, search, and social media. In the case of smartphone operating systems and their respective app stores, the platform duopoly offers few alternatives for complementors. In other cases, such as search advertising, alternatives to Google are nonexistent.

Offering products or services on multiple sites is desirable for DEs, but doing so may not be simple. To illustrate, after an update for Snapchat’s app was downloaded by Android users, it was found to be buggy compared to the corresponding update on iOS, and this had a significant negative impact on revenues (Constine, 2019). In other cases, uploading videos to both YouTube and Instagram is easy because they are available on multiple operating systems. Nevertheless, each OS has different goals, payment algorithms, audiences, and formatting, and thus a successful presence on each requires optimization, which introduces additional cost.

To remain successful, a platform must retain its complementors and therefore implement measures to make multihoming difficult. For example, one tactic is to prevent entrepreneurs from informing their audience/customers that they are moving to another
platform, or even that they offer content on another platform. In another example, YouTube cracked down on creators that promoted their streams on the competitor platform, Twitch. Creators who promoted their wares this way had their YouTube accounts terminated with no warning (Vincent, 2018). Multihoming is a common, but problematic response for DEs, but is almost always resisted by the platform.

6.2. Diversification of Income Sources

Diversification of income sources is another strategy to ease dependence. On certain platforms, it is possible to establish a variety of income streams. For example, YouTubers who have a large following can create income sources beyond those generated by advertising. As Figure 2 illustrates, YouTubers leverage their audience to generate income from personal appearances, merchandise sales, in-video product placements, and paid content such as classes. Because advertising income is low, all but the most successful YouTubers need some combination of other income sources. Not surprisingly, this can expose a tension between the DEs who need to diversify their income streams and the platforms aiming to increase income and prevent defection. YouTube introduced new rules meant to capture either a portion of the alternative income or, at least, direct it through YouTube. In 2017, YouTube began blocking YouTubers who were appealing for their followers to pledge funds to their Patreon sites and, instead, forced them to route the funds through YouTube’s Channel Memberships (Kulp, 2017).

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4 To better control sponsorships, in 2016 YouTube acquired FameBit, a firm that connects creators with brand sponsorships. Here, YouTube created a direct competitor with the larger ecosystem in which a cottage industry of firms that connect creators with sponsors had emerged. As part of YouTube, FameBit can provide superior information to complementors (Weiss 2018), thereby having an advantage over competitors and, as importantly, further “capturing” the ecosystem complementors. It also means that YouTube will have even greater visibility into the success rates of advertisements.
The ultimate problem for owners is when the complementor develops sufficient alternative sources of income that they no longer need the platform, such as was the case with Justin Bieber, who initiated his career on YouTube but became a mainstream star and left the platform. Similarly, authors can use Amazon’s self-publishing platform to launch their careers, and the most successful often move to traditional publishers. A final example is successful online brands that establish physical stores, in part to diversify because their online operations are entirely dependent upon platforms such as Amazon or Instagram. Cultivating alternative income sources can counterbalance platform dependence.

6.3. Collective Action

Collective action by DEs can be wide ranging, from complementors forming user forums to discuss the platform’s actions and, perhaps, develop self-help strategies, e.g., Turkopticon (Silberman & Irani, 2015), to withholding their products or services from the platform. Finally, if the platform rules or ecosystem become sufficiently difficult to live with,
DEs may abandon it, with the ultimate result being the demise of the platform. Thus far, most collective action has been confined to complaints regarding changes in the terms and conditions (Dunphy, 2017) and has not progressed further.

Collective action can be effective, even though fewer organizing tools are available in virtual environments, where the “public space” is, in fact, owned by the platform. For example, in November 2018, AbeBooks (owned by Amazon) banned several antiquarian booksellers because their countries did not have acceptable banking institutions. In solidarity with their competitors, hundreds of booksellers removed their listings. Given the strong response, AbeBooks reversed its decision (Flood, 2018). In this case, the DEs had alternatives and close networks, and the platform had few substitutes, unlike if, for example, YouTubers withheld videos en masse.

In general, DEs face the platform as individuals, often as competitors. Collective action is normally confined to protesting rule changes and requesting that the platform reconsider its actions. In most cases, providers are scattered globally and cannot even identify one another. Moreover, when websites are established for interacting and discussing various issues, they have no way of excluding platform representatives from participating incognito. Thus, the conditions for solidarity, such as a common workplace or community, that exist in the physical world are far less prevalent in the virtual world.

6.4. Disintermediation

By definition, platforms function as intermediaries between various parties. If the parties are able to identify one another, then it may be possible for them to disintermediate the platform in future transactions. Such disintermediation is most likely to occur when repeated interactions build trust. With sufficient trust, through an off-platform communication medium,
DEs can connect directly with their customers, thereby excluding the platform and sharing the platform’s fees. Disintermediation is an existential threat for a platform, because circumvention unequivocally reduces the platform owner’s power (Zhu & Iansiti, 2019).

6.5. Legal Action

Because the relationship between the platform and its DEs has largely been the province of contract law, comparatively little litigation by complementors has occurred, as they joined the platform voluntarily and can leave freely. This may be changing, as the competition authorities in the European Union have investigated and fined some platforms for violations. In the US, greater attention has been paid to platforms such as Amazon (Khan 2016). Actions have been taken in other countries—for example, in India, small retailers successfully pressured the government to promulgate new rules that make it difficult for retail platforms, such as Amazon and Walmart-controlled Flipkart, to sell directly to consumers and operate an online marketplace. This action would prevent a platform from competing directly with its complementors. In the case with Uber and Lyft, whose complementors may be viewed as workers, some court cases have argued that the drivers are not contractors (or micro-entrepreneurs) but, rather, should be classified as employees. Recently, the music platform Spotify argued that the 30% fee Apple charges for all downloads to the iPhone presents unfair competition, because of the newly introduced Apple Music (Ek, 2019). In response, Apple argues that the fee is reimbursement for its vetting function that protects the ecosystem (Apple, 2019). How far legal action will progress to protect DEs is unknown.

6.6. Summary

As we have shown, DEs actively implement strategies aimed at weakening the platform’s grip. The strategies to counterbalance the platform’s power can be effective, but
they are costly, especially for smaller firms. Not unexpectedly, the platform opposes attempts, either passively or actively, to weaken its grip over its complementors. The conundrum is that the platform is expected to curate the ecosystem, because if it is uncurated, it is likely to experience a tragedy of the commons (Hardin 1968). However, in the case of platform firms, the curation role is played by an interested party and therefore may lead to judgments in its own favor.

7. Discussion and Conclusion

Platforms have been acknowledged as having a profound effect upon labor and labor relations (Kenney & Zysman, 2018) and the nature of competition (Khan 2016; Parker et al. 2016). Research on entrepreneurial dynamics in platform ecosystems has concentrated upon the ease of entry, market access, and other such technical conditions. With very few exceptions, the unequal power relationship between the platform owner and the ecosystem complementors has been ignored. When the relationship between owners and complementors is discussed, it is in terms of commensalism or mutual benefit. Clearly, the platform owner as the provider of tools and ecosystem curator is necessary and deserves compensation. But the power asymmetries are so stark that complementors are best understood as PDEs whose very existence depends upon the platform.

Consider again entrepreneurs in the pre–internet platform era. Certainly, Microsoft could destroy ecosystem complementors, as Netscape discovered to its peril. However, for a variety of reasons, including enforcement of US antitrust laws, Microsoft was limited in its use of platform dominance to enter the business of its various complementor firms that were either other software vendors or PC producers. Today, all kinds of economic activities are being organized by platforms, offering greater consumer choice. In retailing, the production of
music, news commentary, or software, the provision of rides or accommodations, and all sorts of other products and services, both entrepreneurs and existing businesses are being integrated into platform ecosystems. Platforms provide the entrepreneurs with various boundary resources to ease their market entry, access to customers, and legitimacy. In return, entrepreneurs’ businesses are vulnerable in ways that they were not in the offline world. Entrepreneurs whose business is dependent upon a platform face a level of precarity now that is far greater than during the pre-platform era. The DE’s business is entirely exposed to the platform owner’s panoptic gaze.

Entrepreneurship and building a business have always been fraught with risk. However, the willingness to bear this risk has been coupled with the belief that success is based on one’s own efforts—a world in which most capable entrepreneurs can build a sustainable business (Sarasvathy, 2008). Dependence upon a platform challenges such assumptions, as this risk extends to the basic tools for doing business, as platform owners can control access to customers, prices, profit margins, and thereby survival of the business.

Awareness of the encompassing power of these platforms is growing, as is the precarity of entrepreneurs who depend upon these systems. To illustrate, a business that is not discoverable through a Google search can effectively be said to not exist. This demonstrates that current discussions of regulating platforms still have not grasped the dynamics of the new business environment, in which platforms have acquired godlike powers to banish errant complementors from the garden, can see all activities within their realm, separate parties to a transaction, and unilaterally change the conditions for any and all users—either in very granular fashion or comprehensively.
Governments have gradually gained awareness that these platforms are using their god-like powers in their own interests and against the PDEs. In response to the growing number of grievances against unfair treatment, policy makers have been increasingly concerned with the appropriateness of current policy frameworks to promote sustainable and healthy environment for platforms’ entrepreneurs. For example, the Indian government recently required Amazon and the Walmart-owned-Flipkart to choose between being online retailers and sales platforms because that they could not both have their own inventory and be online marketplaces. And the European Commission reached a political deal on the adoption of a regulation that applies to the entire platform economy, including online marketplaces, app stores, social media for business, and search engines, aimed at reinforcing trust and promoting fairness and transparency in the relationship between platforms and entrepreneurs (European Commission, 2019).

Reconceptualizing entrepreneurs in a platform economy as dependent is particularly useful when we consider that an increasing number of scholars have proposed that entrepreneurship is an effective response to the evolution of work to be more contingent, fluid, and uncertain (Barley et al., 2017; Brynjolfsson and McAfee 2014). What we have shown is that the platform’s provision of resources to entrepreneurs is a poisoned chalice, because it also locks in the entrepreneur. Therefore, what is the meaning of entrepreneurship in a platform ecosystem? Under these circumstances, how can DEs enact the “emancipatory potential of entrepreneurship” (Rindova et al., 2009)? To what extent do entrepreneurs understand this dependency when developing their business on a platform and how does this awareness influence their actions? Finally, what are entrepreneurs’ degrees of freedom in
developing their business when the platform can identify those creating Schumpeterian rents and act to appropriate them?

What is certain is that entrepreneurship researchers must also study the power asymmetries inherent in the platform economy, if they want to understand the dynamics of these markets and provide a more compelling picture of entrepreneurship in the digital era.

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