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Employment, Work, and Value Creation in the Era of Digital Platforms

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Platforms are changing the very fabric of modern society

At least since the introduction of Intel's first microprocessor in 1971, rapidly evolving digitization has provided an ever-growing number of tools that empower, but also nudge or even force, individuals and organizations to change their behavior. The widespread emergence of digital platforms is arguably the most revolutionary aspect of digitization in the past decade. Digital platforms should be understood as intermediaries that reorganize economic and social life (Barley, 2015; Kenney & Zysman, 2016; Orlikowski & Scott, 2015; Scott & Orlikowski, 2010; Srnicek, 2017; van Dijck, 2013).

In this chapter, we consider the international scene primarily through US-based and globally prominent digital platforms in terms of the implications of their increasing adoption. In contrast to other scholars, who offer taxonomies of platform types (see, e.g., Fumagalli, Lucarelli, Musolino, & Rocchi, 2018; Li, Nirei, & Yamana, 2018), we present a taxonomy of work and value creation in the platform economy (Kenney & Zysman, 2016). Our taxonomy defines main groups that platform workers fall into.

Although our focus is work, we do not confine ourselves to digital labor market platforms that provide access to paid labor. This would dramatically understate the impact of platforms. Labor market platforms, such as Upwork, Fiverr, and Uber, are only a part of a larger story that is more complex and more significant. First, although some of the world's most valuable corporations are platform companies, firms and organizations in nearly every industry are not only creating websites but also building platforms that can manage their interface with the external market and society (Parker et al., 2016). Along with a long tail of smaller platform firms and startups that nurture new platforms, these are a significant source of direct and arm's-length employment and thus of platform work. Second, some platforms establish markets for digital content. In these markets, the virtual good—as opposed to the physical manifestation of the labor input that went into creating it—is traded. In these

consignment markets, the authors license copies of their creations to platforms, allowing it to manage monetization. Consignment markets existed before digital markets, but platforms reshaped their scale and scope. Our broad focus thus encompasses three categories of work: platform firm employment, platform-mediated work, and platform-mediated content creation.

Because platforms often directly shape marketplace interactions, they have great potential for disrupting market structures (Kenney & Zysman, 2016; Zysman & Kenney, 2018). For example, the increasing centrality of platforms in the delivery of goods and services is changing the sectoral composition of economies and thus has both substitution and budgetary effects. Some intermediation, such as wholesaling, might vanish as separate activities and be provided by a platform that also offers B-to-C (business-to-consumer) services. If a platform gains market share, a comparable non-platform provider is likely to have lost it; platforms such as Uber, Lyft, or Airbnb offer lower prices for transportation and lodging, respectively, while expanding the market size (Parrott & Reich, 2018).

Digital platforms are changing the organization of competition, work, and consumption—and thus the very fabric of modern society. Yet the ultimate outcomes will be determined not by technology but, rather, by business strategies, consumer choices, and policy decisions. Further, although many of the largest platforms are global in scope, at least some aspect of adoption and use will be shaped by national choices and characteristics.

Platforms decrease interaction frictions and enable new interactions

In technical terms, we accept the definition of Ghazawneh and Henfridsson (2015) of a platform of interest as “an extensible cloud-based software stack enabling multi-sided interaction among contractually independent parties.” These “software-based external platforms consisting of the extensible codebase of a software-based system that provides core functionality shared by the modules that interoperate with it and the interfaces through which

they interoperate.” The platforms of interest are those that are online, cloud-based, and accessed through a wide variety of edge devices, smartphones, personal computers, and – in the future – other “things.” Each platform provides boundary resources, such as application programming interfaces (APIs) and software development kits, to third parties so that they can build further applications on them to create ecosystems of complementors.

But platforms are not just software stacks; they are also governance structures. If a digital platform is designed properly, it attracts complementors that form an ecosystem of service and product providers that operate through the platform. However, this does not refer to the power that the platform owner has over the ecosystem participants who make asset-specific investments in a specific platform. The ecosystem metaphor elides that the successful platform owner often “taxes” ecosystem participants for their use. Further, the ecosystem metaphor also omits the possibility that the platform owner is often in a position to absorb valuable functionality or resources from complementors. The platform owner often can unilaterally change not only the share of any income accruing to the various participants, such as subsidizing one side of the platform with income from the other side, but also the rules of participation in the ecosystem, as has recently been seen on Facebook, Amazon, Google, and other platforms.¹

A platform not only controls but actively shapes its participants’ user interfaces and access to other participants. This is in the best interest of most users, for example, when the content on the platform is curated or when version control is handled appropriately, but this also gives the platform power over participants. As the platform grows and interaction with it intensifies, it accumulates large and growing volumes of information.

¹ Cutolo and Kenney (2019) have referred to the platform ecosystem members as “dependent entrepreneurs.”

Platforms exploit key features of digital technologies to decrease interaction frictions or even make possible interactions that never could have occurred before. Because platforms establish multisided markets, they can have either or both direct (same side) and indirect (opposite side) network effects. Thus, the sheer number of transactions performed by a platform not only improves it but also allows decreasing costs due to scale. This implies an initial chicken-and-egg problem that the platform provider must solve: there is no incentive to join a platform that does not already have many participants. Network effects, combined with scale and scope effects of digital technologies, can often cause winner-take-most markets that can be dominated by and controlled by one or two firms. This domination depends on the particular markets. For example, online remote work has a larger variety of platforms, often separated into particular verticals. Other sectors, such as travel, initially had many online entrants, but then markets were consolidated through acquisitions, creating high levels of concentration.

Looking at the most popular platforms internationally today suggests that, so far, we have largely seen a “Silicon Valley” version of platforms (except in China, which has its own dynamics), in which, during the early stage, startups are structured to pursue growth at all costs so as to achieve market domination.² Although some experiments with a variety of alternative organizational principles have taken place, nearly all the most widely adopted platforms have been introduced by for-profit companies, which are our focus in this chapter.

Platform Work Taxonomy

In this section, we extend the platform work taxonomy proposed by two authors of this chapter (Kenney & Zysman, 2019).³ The core strength of this taxonomy is that it distinguishes

² There are a few exceptions, such as Spotify and Booking.com. On the globalization of Chinese platform firms, see Jia et al. (2019).

³ Other platform categorizations include Fumagalli et al. (2018) and Forde et al. (2017).

between work at and work generated by platform companies, on the one hand, and work in the platform ecosystem, on the other. The first, smaller set consists of workers who create and maintain the platforms. The second, larger set consists of workers in the platform ecosystems, whom we further divide into those undertaking platform-mediated work and those performing platform-mediated content creation. We also include uncompensated user-generated content (Terranova, 2000).

A common mistake made when considering work in the platform economy is thinking of it only in terms of employment. Because of platform ecosystems, the vast majority of the individuals receiving income are not employed by the platform firms or by any firm. For example, millions of individuals or small limited liability corporations are Apple App Store and Google Play operators; Lyft and Uber drivers; Airbnb hosts; Amazon Marketplace, eBay, Etsy, and Instagram vendors; YouTubers; Amazon book publishers; and Kickstarter- and Indiegogo-funded project creators. They all generate income through platforms. These vast dependent ecosystems are difficult to measure, but have recently received attention from various statistical agencies and private sector research institutions (Allard & Polivka, 2018; Farrell & Greig, 2016). Finally, an enormous and perhaps impossible to measure population comprises workers building websites that are meant to be discovered by Google and managing their firm’s social media strategy and individuals updating their LinkedIn profiles—all of whom are creating value for digital platforms. In Table 1, we present a taxonomy so that the number of income generators can be empirically measured.

Table 1: Labor Force Distinctions in the Platform Economy

Platform type	Employment type	Typical examples	Compensation type	Labor conditions	Value creation process
Platform firm					
Venture labor	Full time	Google, Amazon,	Salary and stock options	Excellent	Creating and maintaining platform

		Facebook, Snap, Airbnb			
Contractors (provide service to platform firm but not employees)	Full or part time	Dynamex, LeapForce	Salary or by the job	Precarious, mostly low wage	Routinized
Platform-mediated work					
Platform-mediated marketplaces	Independent or contractors	Amazon, Craigslist, eBay, Etsy	Salary or by the job	Low wage or precarious	Direct work, including logistics
Platform-mediated in-person service provision	Contracted service through platform (contested)	Uber, Airbnb, Lyft, PostMates, GrubHub	Normally, but not always, set by platform	Gig, low income	Provide service, sometimes monetizes assets
Platform-mediated remote service provision	One-time project contract	Upwork, Fiverr, InnoCentives, Amazon Mechanical Turk	Agreed upon by the job	Gig, low income	Project work
Platform-mediated content creation					
Consignment content creators	Not employed	YouTube, Apple App Store, Google Play, Twitch	Income from sales or share of advertising	Skewed, with few having large returns	Content creation
Non-platform organization content producers (e.g., websites)	Employed or contractors	All organizations with a web presence	Salary or by the job	Varies widely	Build websites, etc., for their firms
User-generated content	Not employed	Google, Facebook, Yelp!, Snapchat	Use of the platform	N/A	Produce data from which value is extracted

Source: Adapted from Kenney and Zysman (2019).

Platform Firms

At the center of the ecosystems are the firms operating platforms. Many domains have just one or a few dominant firms. Nonexistent or minimal direct competition places these firms in an excellent position to extract value from one or more sides of the platforms, and their profit margins can be abnormally high (e.g., Apple, Facebook, Google, and Microsoft).

Platform Firm Employees: Venture Labor

The term “venture labor” (Neff, Nardi, Kaptelinin, & Foot, 2012) refers to the platform firm’s founders and employees; if successful, these firms grow into large corporations. Their employees comprise only a small proportion of the individuals receiving income in platform ecosystems. Particularly during economic booms, the established platform companies offer not only high compensation but also remarkable benefits for their direct employees. Many new startups are being funded to establish platforms in a wide variety of sectors. These startups are predicated upon attracting talented employees capable of working long hours in the hope of building a successful business. If the firm succeeds the founders and early employees can reap fabulous returns due to their stock holdings.

Platform Firm Contractors

Platform firms typically have many workers who work via either short-term direct employment or temporary help firms’ arm’s-length contracts.⁴ These temporary employees and contractors can work remotely or even on site and directly with venture laborers, but nearly always receive lower pay, fewer benefits, and less job security. The sheer breadth of the activities that the contractors undertake is noteworthy. Many are what Lilly Irani (2015) calls “data janitors,” who work both on- and off-site to perform not only coding but also search engine result monitoring, data cleaning and organization, vetting of uploaded material for prohibited content, and many other tasks (Gillespie, 2018). For example, in 2012 it was reported that Google Maps employed 7,100 people, of whom 1,100 were full-time employees and 6,000 were contractors (Carlson, 2012). A recent Bloomberg news article estimated that Google has as many contractors as regular employees (Bergen & Eidelson, 2018).

Platform-Mediated Work

⁴ For a more general discussion of the temporary help industry, see Hyman (2018). For a discussion of the complicated and contradictory perception of these contract employees, see Barley and Kunda (2004).

The work discussed above concentrates on the platform itself. Organizations and individuals performing platform-mediated work are integrated into the platform's ecosystem or are often called platform complementors. This work depends upon the platform, and those doing the work are subject to the platform's rules and regulations. We identify two distinct types of platform-mediated work. First, platforms often establish marketplaces that facilitate the sale of goods and services; some examples are eBay and Etsy. Although the good or service may be delivered offline, the transaction is initiated on an online platform. Second, platform-mediated labor markets allow potential customers to contract for labor, which may be provided either in person and remotely.

Platform-Mediated Marketplaces

Platform-mediated marketplaces were one of the earliest internet websites. Initially, many stocked their own inventory, but with a few exceptions, the most notable of which is Amazon, most of these retailers failed or were acquired, often by Amazon. It was the most powerful survivor of the retail conflagration that hit the entire internet sector when the dot.com bubble collapsed. Despite the collapse, over the past 15 years retail has gradually moved online; today approximately 9 percent of all US retail purchases are completed using online intermediaries, and this has been growing, over this same 15 years, approximately one percentage point a year (Census Bureau, 2018). This tendency is global.

The online marketplaces have several permutations. For example, Amazon is both an online retailer, on its own account, and a platform-mediated marketplace hosting other sellers, both businesses and private individuals. However, Expedia serves as merely an intermediary between travelers and their needs for accommodation and transport. One profound implication of platform-mediated marketplaces, and online sales more generally, is that an increasing proportion of sales is initiated online. Typically, online retailing has higher sales per employee,

even when compared to highly efficient competitors, such as Walmart (Wigglesworth, 2017). Online retailing dramatically affects the viability of physical retail outlets (Townsend, Surane, Orr, & Cannon, 2017). Although employment in physical retail should be expected to increase, it will be in warehousing and logistics. Therefore, work in retail stores that employ college students and moderately educated individuals may be replaced by warehouse work, which has little need for those with a college education. Because many retailers on platforms such as eBay, Etsy, and Amazon are independent, some production and storage could shift to private homes. Small-scale providers depend on platforms for customer engagement, logistics, and several other aspects of their businesses. Warehouse work is more easily automated, providing further opportunities for the displacement of workers. This has implications for labor in terms of types and locations.

The character of work related to platform-mediated marketplaces is typically different from venture labor. For example, back-end fulfillment, for instance, in Amazon's warehouses and even more so at outsourced fulfillment firms, such as Dynamex, provides demanding work conditions with low pay and meager benefits. Although platforms such as Etsy or eBay offer sales outlets and opportunities for income generation, the responsibilities for fulfillment and buyer satisfaction fall upon the vendor, who is a free agent. Some vendors can build sound businesses on these sites, but most earnings are precarious. These businesses are also susceptible to competition, changes in the strategies of the platform owner, fickle consumer tastes, and any misfortunes that befall the vendors.

Platform-Mediated In-Person Service Provision

In-person services have been provided by both corporate and independent contractors. Because of the digital platforms, an increasing proportion has been reorganized as a digital intermediary. Work contracted through such labor platforms can be thought of as temporary

one-off “gig” work. The most discussed example is Uber, which, with minimal vetting, welcomes both casual and full-time drivers. This easy entry of drivers is vitally important, because it exposes the drivers to competition from drivers who are willing to provide the service at yet lower prices. Part-time drivers can enter the market for short periods when they need income and thus drive down wages for full-time drivers or direct competitors—taxicab drivers (Hall & Krueger, 2018). During periods with the highest demand, new drivers can flow into the market and drive down prices, but also satisfy demand when full-time drivers would normally be busy and make the most money (Dubal, 2017; Hua & Ray, 2018). This distinction between those who enter the market idiosyncratically, but not full time or as a career, and those who plan to use the platform for a full-time, permanent source of income is critical (Hua & Ray, 2018). By dissolving entry barriers, these platforms create (1) competition between platform and non-platform providers (regular taxis) and (2) part-time and full-time platform providers, thereby depressing earnings for all.

Although much of the focus has been on Uber and Lyft, other platforms have attempted to organize such gig work. Another variation is Airbnb, through which owners of real estate can rent their homes short term. Other less successful in-person labor platforms include TaskRabbit, which allowed workers to bid on various chores. TaskRabbit never achieved success and was eventually sold to Ikea. Other variations on the Uber model include delivery services, such as DoorDash in the US and Deliveroo in Europe. While providing income, this work is precarious and competition threatens to lower prices. Even with Uber, the question of how many of these firms will succeed is uncertain, as even the highly touted Uber loses enormous amounts of money (Conger, 2018).⁵

⁵ For further discussion of the ability of these new entrants to lose enormous amounts of money to tip the market, see Kenney and Zysman (2018).

Platform-Mediated Remote Contracting

Using telecommunications networks and internal firm platforms to contract for remote workers has a long history (see, e.g., Dossani & Kenney, 2009). The recent change is that firms and individuals are increasingly willing to contract freelance workers online. The platforms offering this work are quite diverse, as are the tasks for which buyers contract. They range from low-skill micro-tasks, such as labeling images for Amazon Mechanical Turk (Ross, Irani, Silberman, Zaldivar, & Tomlinson, 2018) to high-skill projects, such as search engine optimization of a customer's website via Upwork (Pajarinen et al., 2018). Another site offering high-skill work is Innocentive, where customers requiring sophisticated problem solving portray it as a challenge, offering a prize for the individual or team with the best answer (Lewin & Zhong, 2013).

Remote work provision can offer an alternative to outsourcing to a large service provider. Equally important, department-level managers can hire labor without increasing headcounts or making long-term commitments. It also allows managers to access temporary labor to meet fluctuating demand. The limits of such offshoring are not easily measured, but constant efforts are made to find new tasks that can be discharged remotely through the mediation of a digital platform. Here again, it is hard to estimate how many individuals receive income through work platforms. However, in a 2018 Securities and Exchange Commission filing, Upwork (2018) claimed to operate the largest online global marketplace for freelance workers. For the year ending June 30, 2018, it had a gross services volume of \$1.56 billion, and 375,000 freelancers completed nearly 2 billion projects in over 180 countries.⁶ Upwork is the

⁶ If the number of freelancers is divided by income, the average income per freelancer was approximately \$4,160. This suggests that the average freelance is working part-time and also relying on other sources of income.

largest of these firms, which are many and provide a broad range of services distinguished by size, location, and specialization.

Platform-Mediated Content Creation

Content, in all its manifestations, made the web valuable and Google, Facebook, LinkedIn, and (earlier) Yahoo! valuable companies. We separate platform-mediated content creation into three categories. The first is user-generated content uploaded to platforms where the content and, in certain cases, the audience created for that content can be monetized. The second is content generated by existing organizations posted on the web or existing platforms as part of the organization's strategy. This content creation process is an enormous source of employment both directly and through contracting and has been ignored in platform-related employment calculations. The third is the gigantic volume of uncompensated user-generated content and data created as people surf the internet, interact on platforms such as Facebook and Instagram, and upload their information onto LinkedIn. This content is the core asset for many platform firms.

Consignment Content Producers

Platforms such as the app stores, YouTube, and Amazon Publisher Services are marketplaces for virtual goods or content. The providers produce content, which is monetized through the platform. In these consignment markets, the authors license a copy of their creation to the platform, which then offers it to its users. A platform specializing in content is worthless without the creators. However, when the platform becomes dominant, much of the power shifts to the platform owner.

This category encompasses a wide range of activities. In some cases, such as the app stores, the content is often sold for a relatively nominal fee, and the income is generated by other means, such as in-app purchases, which is prevalent in online games. In other venues,

e.g., on YouTube, the creators generate revenue not only through advertising but also by monetizing their audiences in a many innovative ways such as crowdfunding and (paid) personal appearances. The market for these products is skewed, with a few huge successes and a long tail of content that generates little income (Brynjolfsson & McAfee, 2011).

The consigner is effectively a freelance content producer. Consignment has long existed in the art world. However, internet platforms have dramatically increased opportunities for such business models. Before the existence of the internet and independent publishing, authors wrote novels, and some convinced publishers to publish them. In the traditional publishing world, publishers were gatekeepers who selected only a few authors for publication. The remaining materials were never published and thus had no opportunity to prove their market value. Internet-based independent publishing allows written materials rejected by traditional publishers or shelved with no consideration to be marketed. Effectively, these new content delivery platforms have lowered entry barriers, permitting excluded creators to enter, enlarging the market but also possibly threatening traditional publishers. Conversely, today, existing publishers and successful offline authors are threatened with a loss of market share, pricing control, and, eventually, displacement. The ultimate results of these new delivery methods are unclear. For example, the London-based *Guardian* suggests that midranking authors with long-standing publishers are experiencing a significant loss of income (McCrum, 2014). Flappy Birds on the Apple App Store was a successful game that no software publisher would have backed because it was so simple and crude.⁷ New content, new distribution channels, and many new content creators have entered the market created by platforms.

Non-Platform Organization Content Producers

⁷ At the height of its popularity, the very simple and even crude Flappy Birds game was estimated to earn \$50,000 per day through in-app purchases, before the game creator removed it from the Apple App Store.

Nowadays, every firm and every organization must create a website to communicate with customers, employees, communities, and constituencies. Google indexes and monetizes the search for these websites by users. The firms must be indexed by Google to be found: it is the librarian for the internet. Today, what cannot be found by Google effectively does not exist.

To illustrate, Nike's website provides a plethora of online materials, including public relations, advertising, sales, and investor information. It is a virtual location constructed by paid employees (though portions of the site may allow users to post comments, photos, etc.). A search for Nike on Google may trigger an advertisement by either Nike or another firm, and the appearance of this advertisement triggers a micropayment to Google. In an economic sense, Nike's work became free labor for Google, while it is a cost of doing business for Nike. Those workers building websites are creating value for their employer, but it is also creating value for Google.

The number of paid employees and contractors working on the digital content of existing organizations is unknown, but—among the categories we consider here—it is far larger than those employed by the platforms.

User-Generated Content

On many of the most valuable platforms—including Facebook, Google, GitHub, LinkedIn, Snapchat, Twitter, Yelp, and Instagram—users either upload content or generate content-like virtual products (e.g., GitHub's open source software) in using the platform (Lanier, 2013; Terranova, 2000). The platform incurs the costs of providing the service. Platforms add value to this content by categorizing, storing, and serving it as well as making it discoverable. Although end users provide the content free, platforms develop strategies for monetizing it (Lambrecht et al., 2014), primarily through advertising or selling premium access

The salient feature of online value creation is the enormous volume of what has been termed “free labor,” that is, the exchange of user-generated content and user information for access to a service, which is then monetized via the analysis and sale of either data captured or user access to third parties, such as advertisers. Most important, unlike radio or television, the internet is bidirectional and provides a record of virtually all activities online (Huberty, 2015). Platform companies “mine,” repurpose, and monetize user-generated data, which has little value before it is recorded, curated, analyzed, and delivered via a suitable business model.

Observations on the Platform Labor Taxonomy

By developing a taxonomy of work, we elucidate the dimensions of value creation being enabled. Digital platforms are rapidly becoming intermediaries in many sectors and reshaping them and their work, value creation, and value capture. If Marc Andreessen was correct in his observation that “software is eating the world,” we might go further and say that platforms are organizing the economic world and, by extension, the world of work. We might go even further and say that the conventional word “work” is no longer meaningful. It may be better to think about human activities in terms of value creation and compensation for it.

Consignment content production continues to grow rapidly, as the world’s consumption patterns shift to online delivery. Entire new sports categories have arisen, such as fantasy sports played on online platforms—a phenomenon that is also transforming the way in which traditional sports are monetized. Consider, for example, the e-sports real-time gaming platform Twitch.tv, which broadcasts e-sports (and, increasingly, other types of content). What is most interesting is that an entire ecosystem of commentators has emerged in addition to the players (Johnson & Woodcock, 2019). Here again, both the players and commentators are complementors in the ecosystem, but for our purposes, what is important is that they are generating income.

In addition to the income from advertising, YouTubers develop extra-platform opportunities for income generation. Further, though each genre of YouTube videos demonstrates certain patterns or, shall we say, “recipes,” there are differences in terms of income generation. For example, music or skills-oriented videos often offer premium classes for an enrollment fee. A multitude of product placement strategies can be employed. In other cases, a YouTube star can develop a more traditional entertainment career, including live performances. Finally, some YouTubers have developed their own clothing or cosmetic brands . Sometimes, these platform ecosystem complementors post to multiple platforms, including YouTube, Instagram, Twitter, and Facebook. If they have a web store, it might be on Amazon or created using Shopify.

It has long been an axiom in economics that it is difficult to measure the impact of the value created by digital technological developments in terms of gross domestic product (Brynjolfsson & Kahin, 2000; Crafts, 2018). Implicit in our taxonomy is the difficulty of determining how work should be measured. Measurement difficulties are proliferating .

The first difficulty is that although the McKinsey Global Institute (Manyika et al., 2016) found that between 20 percent and 30 percent of the US population is engaged in some independent or gig work, much of it was not connected with an online platform. This is an important distinction; identifying independent work is one thing; establishing that total independent work has grown because of digitization is another. More recently, Abraham, Haltiwanger, Sandusky, and Spletzer (2018) explored the problems that governments confront when trying to measure the gig economy. Reinforcing the McKinsey Global Institute’s findings, these authors discover that traditional job surveys, because of their wording, which focuses on traditional employment relationships, may not elicit information from respondents who receive income from nontraditional income-generating activities, such as someone who is a YouTuber or other social media influencer, or someone with a small eBay sales operation.

They illustrate this by noting that tax filings show an increase in nontraditional income, whereas household surveys do not (Abraham et al., 2018).⁸ These studies might lead to the conclusion that much of the income generated from platform-related activities is supplemental; however, ample evidence indicates that in the labor markets organized by the larger platforms, many individuals depend upon platform-derived income (Farrell & Greig, 2016). Some research has attempted to count the number of individuals operating on a platform (Eurofound, 2018). This strategy may be ineffective, as so many platforms exist, and many are so opaque that measurement of employment, particularly income, would be difficult.

The second measurement problem is that the labor statistics are not straightforward in terms of analysis. Understanding the meaning and measuring the number of jobs (opportunities for earning income) created by the platforms outside direct full-time employment is difficult. Even more difficult is assessing whether the new jobs are of higher quality or better paying than the previous jobs. How can we decide whether working on these platforms is good or bad? Nearly all the research suggests that a significant proportion of the gig economy workforce affirmatively enjoys and seeks such employment (Barley & Kunda, 2004; Manyika et al., 2016; Schor, 2017). Yet many others have little choice but to work through a digital platform. This dilemma is best illustrated by Lyft, rather than Uber drivers. Many Lyft drivers appear to enjoy driving for Lyft, but often they are part-timers working for extra income or even just to keep busy. For these drivers, the work appears voluntary and temporary. Similarly, some Airbnb hosts offer their properties out of necessity, others for the pleasure of meeting new people, and yet others purely to monetize their properties. In each case, the motivations are different, and thus drawing a single conclusion is difficult. What seems certain is that an increasing percentage of the labor force derives at least some income from digital platforms. This is true

⁸ See also Allard and Polivka (2018).

even without including those who create and curate websites and the billions of people who create uncompensated content that is monetized by the platform firms.

Business strategies, consumer choices, and policy decisions determine ultimate outcomes

The platform economy is not merely fissuring the workplace (Weil, 2014) but reorganizing the relations, locations, and activities involved, creating a new and expanding set of arrangements in which individuals can generate income. Some have argued that the digital is blurring the boundaries of the firm (Yoo, Henfridsson, & Lyytinen, 2010), and, from the perspective of work, the permutations of task division and organizational and spatial location have increased dramatically. The tests used for judging whether someone undertaking a task for a firm is an employee or a contractor seem ill-suited for the task. For example, a spate of litigation has argued about whether an Uber driver is an employee or an independent contractor (Sanders & Pattison, 2016).⁹ This issue is so vexing that some have called for a new legal category for such workers (Hagi & Biederman, 2015). The fixation on platform-mediated in-person service provision ignores the other categories that we enumerated and, in this way, confirms our argument that fissuring does not capture the vast dispersion in forms of work underway (Kenney & Zysman, 2019).

Yet all (popular) platforms share one commonality: the power of the platform owners. They are in a strategically advantaged position to absorb resources from the ecosystems spawned by platforms, which they partly share with the employees considered essential for the platforms' success. Platforms redefine power balances between businesses but also the relationships between the firm and labor. The platform owner has tremendous power in relation to members of the ecosystem, who depend on the platform in several ways. First, the platform can change the algorithms determining its operations at will (Lessig, 1999). Second, on most

⁹ Since then, some regulations have been put in place (see, e.g., Khouri, 2018; Morris, 2018).

platforms, the algorithms determining payment and content acceptability are private and not publicized to ecosystem complementors, thus keeping them in a constant state of uncertainty (Scolere, Pruchniewska, & Duffy, 2018). Third, in ecosystems such as app stores or Amazon Marketplace, the platform owner can offer a product that competes with that of an ecosystem member and favor their product on the platform. Fourth, the platform owner has a panoptic view of all activities on the platform and thus can shift nearly any parameter in a way that favors its ability to extract value from the ecosystem. Each type of power affects not only labor and work but also markets, terms of competition, and social dynamics. The Uber driver that can be disqualified as a driver by an unknown algorithm and will then lose income immediately. There is no need for notice; the app simply stops working. YouTubers can have their videos demonetized without receiving any explanation. Not only are they forbidden to monetize new videos but previous videos that earned income are also demonetized. This effectively devalues their entire portfolio, not simply one offending video. In this economic system, labor is ever more precarious, has no recourse for grievances except the firm, but often is even uncertain about what the decision criteria are.

The taxonomy of the labor for the platform economy shows that, in each category, the organization of work and value creation differ. Therefore, a fixation on only one or the other of the platforms—most commonly exemplified by Uber and Amazon—fails to provide a comprehensive perspective on labor in the platform economy. The controversies over firms from Facebook and Amazon to Uber and Airbnb signal the profound impacts of platforms on our economy, society, and income distribution. The ultimate configuration and disposition of work and the beneficiaries of the value created by these platforms will be determined by policy decisions. The power and ability of these platforms to extract such an enormous portion of the social surplus will prompt a political response. The exact character of the changes driven by the move to a platform economy are not knowable in advance. Yet, given the expanding income

inequality, though not due solely to the rise of these platforms, they may lead to increasingly tense and disruptive social and political relations. Better understanding of the roles of different kinds of labor in the platform economy seems imperative for addressing the future of work. Finally, maybe we need to shift from thinking about a world of traditional employment to thinking about one in which income and relative shares of the value created form a better basis for reflecting about contemporary economics.

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