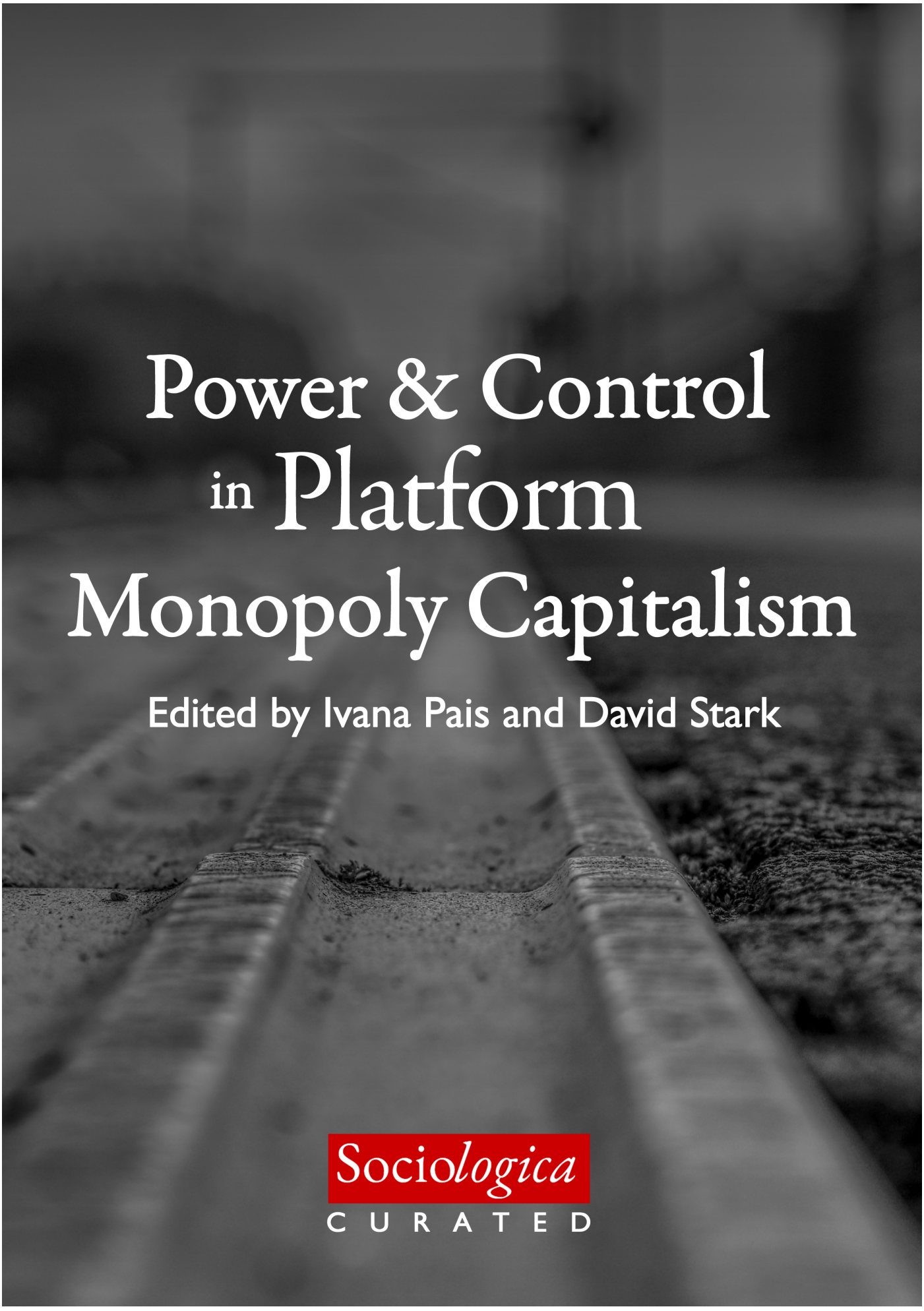

Power & Control in Platform Monopoly Capitalism

Edited by Ivana Pais and David Stark

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Editors' Note: Introduction to the Thematic Issue on Power and Control in Platform Monopoly Capitalism

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In 2001, Paul DiMaggio edited a book entitled *The Twenty-First-Century Firm: Changing Economic Organization in International Perspective*. In the opening sentence of his lead essay,[1] DiMaggio observed that "many people believe the corporation is changing so dramatically that we need a new lexicon to describe it." After pointing to a plethora of disparate attempts by other authors who sought "the right word to characterize the company of the future in a time of dizzying change," DiMaggio presented a masterful summary of challenges to the twentieth-century model and pointed to key elements of emergent alternative models. In that introductory essay and in the theoretically and empirically rich chapters that followed, the book provided a clear picture of the main directions of organizational change. Among these, it anticipated how

> changes in information technology expand the capacity of firms not only to monitor their workers and production processes but also to engage more employees in processes of product design and organizational change, to bring more information into the company, and to get products out to consumers in ways that dramatically alter cost structures and organizational designs (DiMaggio, 2001, p. 4).

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1. Paul DiMaggio, "Introduction: Making Sense of the Contemporary Firm and Prefiguring Its Future," pp. 3–30 in Paul DiMaggio (Ed.), *The Twenty-First-Century Firm: Changing Economic Organization in International Perspective*. Princeton: Princeton University Press, 2001.

By calling attention to these processes, DiMaggio and his colleagues were pointing to issues that go to the very heart of the current debate about platforms. The term "platform," however, never appears in the book. But its absence can hardly be faulted since this new organizational form was only embryonic at the time.

Twenty years later, we devote this Thematic Issue of *Sociologica* to the platform model which, after an extraordinarily rapid development, is arguably the distinguishing organizational form of the first part of the Twenty-First century.

Our Thematic Issue follows on a debate about platforms launched in the journal with the article by Elisabeth Anne Watkins and David Stark "The Möbius Organizational Form: Make, Buy, Cooperate, or Co-opt?" (*Sociologica*, *12*(1), 2018), and then by Gernot Grabher and Jonas König in their article "Disruption, Embedded. A Polanyian Framing of the Platform Economy" (*Sociologica*, *14*(1), 2020). This Thematic Issue takes up the questions posed by these articles, enriches them with new perspectives, and focuses especially on issues of power and control.

The Thematic Issue is organized in three sections.

The lead essay by **David Stark and Ivana Pais** on "Algorithmic Management in the Platform Economy" analyses the platform as a new organizational form distinct from markets, hierarchies and networks. The paper explores how platforms co-opt the behavior of providers and users through non-bureaucratic rules, ratings translated into rankings, and twisted feedback loops that deflect accountability. It relates power asymmetries at the organizational level to coalitions at the regulatory level.

Jamie Peck and Rachel Phillips' article "The Platform Conjuncture" presents a reading of platform capitalism in dialogue with the work of Fernand Braudel, focusing in particular on the idea of platforms as "anti-markets" and looking at their "zone d'opacité." Situating the platform economy geographically as well as historically, the paper introduces a typology of the regulatory and corporate geographies of platform capitalism.

In "The Rise of Online Platforms and the Triumph of the Corporation," **Koen Frenken and Lea Fuenfschilling** challenge the dominant understanding of online platforms as digital marketplaces and develop a mirror-image conceptualization of online platforms as corporations. Analyzing platforms as a historical continuation of the corporation as a basic institution in society, they argue that it is a new corporate form, emphasizing its re-coding capacity as a basis for its transformative power.

Drawing on rich empirical analysis, **Koray Caliskan's** article, "Platform Works as Stack Economization: Cryptocurrency Markets and Exchanges in Perspective," argues that cryptocurrency exchange platforms go beyond marketization processes by providing a variety of functions that are not typically of the market but are nevertheless core to the operations of these platforms. He proposes the concept of "stack" to describe the process of socio-digital economization that takes place in these data money exchanges.

The paper by **Mehmet Cansoy, Samantha Eddy, Isak Ladegaard and Juliet B. Schor**, "*Homines Diversi*: Heterogeneous Earner Behaviors in the Platform Economy," analyzes the heterogeneity of workers as a consequence of the "retreat from control." Interviewing earners from Airbnb, TaskRabbit, and StocksyUnited, they identify three different behavioral models — *homo economicus*, *homo socialis* and *homo instrumentalis* — and discuss the related platform policies.

Janet Vertesi, Adam Goldstein, Diana Enriquez, Larry Liu and Katherine T. Miller, in "Pre-Automation: Insourcing and Automating the Gig Economy," examine a strategic configuration in the technology, logistics, and robotics industries that they call "pre-automation." They argue that some monopoly forms of platform labor may be viewed as an intermediate

arrangement. They discuss Uber, Amazon Flex, and Amazon Delivery Services Partnership Program drivers as paradigmatic cases.

The second section is a *Symposium* on Grabher and König's "Disruption Embedded: A Polanyian Framing of the Platform Economy," with four commentaries.

Koray Caliskan in "Polanyi, Callon, and Amazon: Institutionalist, ANT, and DRAN Approaches to Platform Economies" focuses on Grabher and König's (re-)interpretation of the Polanyian approach through the lens of *marketization* and discusses how the DRAN approach (Devices, Representations, Actors, and Networks) can contribute to an analysis of platforms.

The second commentary, authored by **Kevin Woojin Lee and Elizabeth Anne Watkins**, "From Performativity to Performances: Reconsidering Platforms' Production of the Future of Work, Organizing, and Society" builds on Grabher and König's essay by focusing on how digital platforms are realized on the ground and offers a taxonomy of three ways that people intervene in how platforms produce the future (innovation, articulation, and opposition).

Ivana Pais and Giancarlo Provasi, in "Share vs Platform Economy," analyse the change of register detected by Grabher and König from "sharing euphoria" to "platforms disillusions" and suggest new ways of approaching this dispute, discussing the difference between the Polanyian *double movement* after the crisis of 1929 and the absence of it after the subprime crisis of 2008.

Martin Kenney, John Zysman and Dafna Bearson's commentary, "Transformation or Structural Change? What Polanyi Can Teach Us about the Platform Economy," focuses on the platform as both a symbol and an organizing mechanism. They see socio-technical innovation as the critical fulcrum for the changing dynamics of capitalist accumulation, related to Polanyi's insight that the reach of the market is based upon increased commodification.

Responding to these comments, **Gernot Grabher**, in "Enclosure 4.0: Seizing Data, Selling Predictions, Scaling Platforms," further elaborates the Polanyian interpretative framework. In this essay, Grabher goes beyond the initial contribution by undertaking an entirely original analysis of how the platform model is being extended from services and retail into the business-to-business realm as *industrial platforms* in the automotive and agricultural sectors.

In the third and final *Focus* section **Paolo Magaudda and Marco Solaroli** offer a review essay, "Platform Studies and Digital Cultural Industries." This paper reviews scholarly research on the platformization of cultural industries, addresses three distinctive domains of cultural production and consumption — music, journalism, and photography — and suggests emerging paths for future research.

As readers of *Sociologica* know, publishing special issues is an important feature of our journal. In vol. 14, no. 2 (2020) we published the special issue *From Value to Values, from Field to Discipline: Understanding Journalistic Culture in the 21st Century* edited by Chris Anderson. That followed *The Contamination of Practices: How Practice Theories Matter in Multiple Domains*, edited by Paolo Magaudda and Emanuela Mora, in vol. 13, no. 3 (2019).

In addition to these special symposia, *Sociologica* is also running a special feature, *Society after COVID-19*, publishing essays and empirical studies in vol. 14, numbers 1, 2, and 3 (2020). This topic will be further addressed in vol. 15, no. 1 (2021), in the symposium "Against 'Disaster': Critical Reflections on the Concept" in the COVID-19 context, edited by Rebecca Elliott and Ryan Hagen. This issue will also contain a symposium "Doing Social Sciences Via Comics and Graphic Novels," edited by Eduardo Barberis and Barbara Gruening, followed by a symposium on "Wealthy People between Economy and Society: Structure, Reproduction, Legitimation," edited by Joselle Dagnes & Luca Storti in vol. 15, no. 2 (2021).

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Algorithmic Management in the Platform Economy

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Abstract

The platform model is the distinguishing organizational form of the early decades of the twenty-first century. Whereas actors in markets *contract*, hierarchies *command*, and networks *collaborate*, platforms *co-opt* assets, resources, and activities that are not part of the firm. As a distinctive organizational form, the platform model confronts a distinctive managerial challenge: how to manage value-creating activities that are undertaken on the platform but not in the firm? In a triangular geometry, platform owners co-opt the behavior of providers and users, enrolling them in the practices of algorithmic management without managerial authority having been delegated to them. Acting on their own behalf, the ratings and other activities of providers and consumers are algorithmically translated into rankings and other calculating devices that circulate through feedback loops that are twisted rather than circular. Algorithmic management involves a peculiar kind of cybernetic control because at each fold of the feedback loop accountability can be deflected and denied. Whereas Scientific Management in the early twentieth century offered a legitimating principle for the growth of a new managerial class, algorithmic management in the early twenty-first century is reshaping the managerial class. Its power asymmetries at the organizational level are related to coalitions at the regulatory level in which platform owner and investors are in alliance with platform consumers.

Keywords: Algorithmic management; platforms; Taylorism; rankings; organizational forms.

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Introduction

As of September 30, 2020, the world's most valuable public companies were Apple, Microsoft, Amazon, Alphabet, Alibaba Group, Facebook, and Tencent.[1] Together, these seven companies represented more than $8.3 trillion in market value. All of them are platform businesses.

The rise to prominence of the platform business model has been rapid. Ten years ago, in the third quarter of 2010, in the top positions were two oil companies (Exxon Mobil and PetroChina). Among the GAFAM (Google, Apple, Facebook, Amazon, Microsoft) there was only Apple in third position and Microsoft in the sixth. Apple took the top spot for the first time in the third quarter of 2011, while Google entered the top 10 in 2013 and Amazon and Facebook in 2016. In those ten years, in addition to digital native firms, a significant number of traditional industry leaders were initiating platform projects, and goods and services of a wide range are now carried out by platforms.

Today, much of our daily life is conducted on or with platforms. It is on platforms that we can access information, watch movies, listen to music, read books, shop for all kinds of products, archive documents, and find partners. We go to platforms to get a ride, book travel, support a cause, order food, or finance a project. Do you want to know what the people you care about are doing and thinking? Are you looking for someone for housekeeping, home repairs, medical advice, legal or accounting services, or lectures on any kind of topic? Or perhaps someone to organize your closets or coach you in organizing your life? There are platforms for all of these and more.

Software for your company is provided on platforms; crowdsourcing platforms make it possible to collect ideas, information, or opinions from a large group of people outside the firm; and if you need cybercurrencies, these are also available on a number of platforms (Caliskan, 2020). Traditionally, John Deere manufactures agricultural equipment; but now, equipped with GPS and other software linked to its MyJohnDeer cyber-agricultural platform, its tractors harvest data alongside corn and wheat.[2] And it is on an online platform where researchers share and document BioBricks — DNA sequences encoding specific information and biological functions by the BioBrick^{TM} standard — that members of the synthetic biology community can "mix and match" to build biological devices and systems (Weissenbach, 2020).

In this article we address three fundamental questions about the platform economy that researchers are debating and will continue to debate: i) What are platforms as a social organizational form? ii) What are the distinguishing characteristics of the mode of management on these platforms? iii) How are these features at the organizational level reshaping class relations and coalitions at the broader societal and political levels?

Anticipating our argument: In the following section we ask whether platforms should be conceptualized as markets, hierarchies, or networks. We conclude that the platform model is none of these. Moreover, rather than combining aspects of that triplicate, it is better to understand the platform model as turning them inside out. In elaborating this argument, we make a case that the platform model is a distinctive organizational form. Expressing (indeed, compressing) each of the forms as a verb: whereas for markets the verb is *contract*, the verb for hierarchy is *command*, and for networks it is *collaborate*. By contrast, platforms *co-opt*. With reference to the Möbius topology, platforms co-opt assets that are not part of the firm and create value in a social and economic space that is neither inside nor outside of the platform.

1. Based on the *Financial Times* Global 500 list.

2. See Grabher (2020); and, for an account and photographs literally taken from the field, see Stark and Warner (2013, pp. 90, 94–95, and 108).

In the subsequent section, we examine the distinctive managerial challenge arising from the platform model's distinctive organizational form: how does one manage value-creating activities that are undertaken on the platform but not in the firm? We argue that a distinguishing feature of platform algorithmic management involves its triangular geometry in which platform owners co-opt the behavior of providers and users, enrolling them in the practices of algorithmic management without managerial authority having been delegated to them. Acting on their own behalf, their ratings and other activities are algorithmically translated into rankings and other calculating devices that circulate through feedback loops that are twisted rather than circular. In the peculiar kind of cybernetic control that is algorithmic management, accountability and control can be deflected and denied at each step in the feedback.

In contrast to Scientific Management at the turn of the twentieth century, in the algorithmic management of the twenty-first century there are rules but these are not bureaucratic, there are rankings but not ranks, and there is monitoring but it is not disciplinary. Algorithmic management does not automate bureaucratic structures and practices to create some new form of algorithmic bureaucracy. Whereas the devices and practices of Taylorism were part of a system of hierarchical supervision, the devices and practices of algorithmic management take place within a different economy of attention and a new regime of visibility. Triangular rather than vertical, and not as a panopticon, the lines of vision in algorithmic management are not lines of supervision.

In a third, concluding section, we address the implications of our analysis for class relations and political coalitions. Whereas Scientific Management offered a legitimating principle for the growth of a new managerial class, algorithmic management in platform monopoly capitalism is reshaping the managerial class. Its power asymmetries at the organizational level are related to coalitions at the regulatory level in which platform owner and investors are in alliance with platform consumers.

Markets, Hierarchies, Networks, Platforms

Of what social form is the platform model, and what governs its coordination? For alternatives to choose among, Oliver Williamson (1996) restricts us to two: markets and hierarchies.[3] Max Weber writes of three forms of authority: traditional, rational legal, and charismatic; and Karl Polanyi (1957) identifies three forms of economic coordination: markets, redistribution, and reciprocity. Directly related to Polanyi's trio, but not completely isomorphically, Walter Powell (1990) gives us markets, hierarchies, and networks. Let's begin there.

Platforms as Markets?

Much of the economic literature defines platforms as bi-lateral or multi-sided markets. While not themselves generally buyers and sellers, platform operators produce networked marketplaces for at least two different types of users (e.g., buyers and sellers) skimming off a percentage of each transaction as an intermediary (Castelle, 2016). Often treating one side as a profit center and the other as a loss leader (OECD 2009), platforms "effectively cross-subsidize be-

3. Luc Boltanski and Laurent Thévenot (1991) triple this number, offering six "orders of worth" which can serve as principles for coordination: market, industrial, civic, loyalty, inspiration, and renown. Boltanski and Chiapello (1999) raise the number to seven by adding the network form; Thévenot (2006) adds an eighth, a green or ecological principle.

tween different categories of end users that are parties to a transaction" (Rochet & Tirole, 2003, pp. 1017–1018).

Some platforms are *more than markets* (however multi-sided). At data money exchange platforms (arguably among the platforms most like marketplaces) non-trading activities are core functions. As Koray Caliskan (2020) demonstrates, these exchanges operate as *markets* but also simultaneously as *mints* that make data monies, *vaults* that store money, and *banks* that lend money, as well as operating as *insurance agents, data centers, clearing houses, accounting agencies*, and even as *courthouses* arbitrating cases.

More importantly, platforms do not simply intermediate transactions and extract rents for this intermediation. Instead, with "the capability to systematically track the location, behavior, production, choices, transactions and reviews of millions of people," platforms *extract data* which they algorithmically process and monetize.[4] It is this ownership of data generated by the actions of participants (who do not get a share of the surplus generated by those activities) that distinguishes platforms from traditional market intermediaries.

But there is an even stronger argument that can be made: platforms are not markets, they are monopolies. Jamie Peck and Rachel Phillips go a step further. Drawing on the Braudellian concept, they argue that the "*anti-market* is the true home of platform capitalism." Monopoly capitalism is understood as a "predatory" system, living off of the layers of economic life below, where it operates as a machine for concentrating political-economic power. They identify the monopoly practices of platform corporations as the defining feature of the system (Peck & Phillips, 2020).

If the monopoly power of platform capitalism invites comparison to the classic monopolies of the nineteenth and twentieth centuries, the task of such a comparison is to analyze the distinctive way in which market dominance is achieved and exercised (Rahman & Thelen, 2019, p. 179). The first contrast is that "monopoly power is neither acquired nor maintained through direct ownership — as in the monopolies of the Gilded Age — but has instead accrued through the capacity to control and manipulate markets, both established and new" (Peck & Phillips, 2020). Although some platform monopolies grow by aggressive acquisition of potential competitors, the classic patterns of vertical and/or horizontal integration are less important than *network dominance* — a rapid capturing of network externalities by which a platform becomes more valuable to each user as more people use them. In these winner-take-all (and winner-take-most [Cutolo & Kenney, 2020]) markets, what the winner aims to take is not only the end users but also the enormous number of external stakeholders, typically smaller firms, among them independent developers whose activities are vital for various aspects of the platform but are not part of its corporate structure.

Platforms as Hierarchies?

If platforms are not markets, neither are they hierarchies. Granted, the core administrative component of the platform enterprise is likely governed by bureaucratic methods with (relatively flat) supervisory hierarchies. But as an organizational form, the platform should not be reduced to its corporate core. In our view, platforms are examples of what Watkins and Stark (2018) label the "Möbius organizational form," referring to a topological form with neither

4. See Frenken & Fuenfschilling (2020). Van Dijck and Poell (2013) refer to three processes: datafication, commodification, and selection. That is, platforms store personal data, translate them into economic value, and use them for filtering and customizing the information destined to users.

an outside or an inside. Legally, of course, the platform corporate core has boundaries. But organizationally, platform boundaries are far from clear cut.[5]

Expressed in terms of the triplicate — make (hierarchy), buy (market), or cooperate (network) — the Möbius form adds a fourth: co-opt (Watkins & Stark, 2018). The defining Möbius organizing principle can be stated most simply: as a form, co-opt assets and activities that are not part of the firm. Platforms adopt this principle in many aspects of their operations.

In the first place, platforms are asset-light, leveraging physical assets over which they do not exercise ownership as seen in this often-quoted passage:

> The world's largest taxi firm, Uber, owns no cars. The world's most popular media company, Facebook, creates no content. The world's most valuable retailer, Alibaba, carries no stock. And the world's largest accommodation provider, Airbnb, owns no property.[6]

Second, platforms are not hierarchical in the organization of labor. Platforms are famously notorious for using nominally independent contractors instead of employing workers. For example, drivers for Uber, micro-workers at Mechanical Turk, and home repair workers at TaskRabbit are not employed by the platforms that, nonetheless, manage their activity (Cansoy et al., 2020; Griesbach et al., 2019; Schor, 2020; Watkins, 2020). The same is true for sellers and other providers (for example, on eBay, Amazon, or Etsy). Just as the "independent" subcontractors, such as Uber drivers, are not employees but are the platform's *workforce*, affiliated sellers, such as those on eBay, are the platforms' non-employed *salesforce*. Moreover, some platforms monitor the accounts of their sellers, effectively using them as scouts to identify highly profitable niche markets into which the platform (such as Amazon) will enter as direct competitor.[7] Thus, whether workforce, salesforce, or market research, platforms are co-opting the energy and creativity of actors who are on the platform but not as employees at the platform's core.

Third, and finally, platforms exhibit Möbius-like characteristics not only with regard to labor but also in relation to their users. Platform users, like customers more generally, are obviously not organized as part of a corporate hierarchy. But are users part of a platform? Are they inside or outside? The semantics of platform discourse already points to its Möbius qualities. Where are users? Like the subcontracted workforce/salesforce, they are neither in nor out. Everything takes place *on the platform*. Yes, users are part of the platform; frequently they participate in building it. Of course you are not an employee of Amazon or part of its managerial ranks. But it's not unlikely that you are an Amazon Prime *member*, and a member as well on Airbnb, on Facebook, and Etsy. Perhaps you recently changed your "member status" at Uber.

5. In arguing that the topology of platforms is Möbius-like, we are not the first to question the metaphors of inside/outside or internalization/externalization when studying platforms. Kornberger et al. (2017, p. 7), for example, argue that notions of territorialization — disciplinary power as enclosure — are of limited utility in studying relations of platform power and control. Somewhat similarly, Plantin et al. (2018) observe that "(...) unlike system builders, platform builders do *not* seek to internalize their environments through vertical integration. Instead, their platforms are *designed* to be extended and elaborated from outside, by other actors, provided that those actors follow certain rules" (Plantin et al., 2018, p. 298).

6. Tom Goodwin, senior vice president of strategy and innovation at Havas Media, quoted in Hamish McRae, *The Independent*, May 5, 2015.

7. "PDEs [Platform Dependent Entrepreneurs] innovated new businesses that the platform could then enter and capture, by using its better information and ability to manipulate the platform itself, there by appropriating the innovator's rents" (Cutolo & Kenney, 2020, p. 19). See, for example, the case of Google's entry into the Android market for photography apps in 2015 analyzed by Foerderer et. al. (2018).

And the more you think about it, the more you recognize just how often you are asked if you "would like to become a member" of one or another platform.[8]

In the past (one of us is old enough to remember), membership was something one did as a member of a community, for example in joining a religious congregation, for example, the PTA, or a club. Airlines and grocery store chains extended the idea of membership to frequent flyer/buyer programs. These were typically loyalty programs. Other brands exploited desires not simply to have belongings but to have a sense of *belonging*. Möbius-strip platforms do something different. My "participation" in the Delta Sky-miles program does not affect the product that Delta offers to its other customers. But, as is well-known, my posts on Facebook, Twitter, Instagram and others are part of platform user-generated content. Moreover, my "likes" go into creating playlists at Spotify; my stars, thumbs up and thumbs down are a factor shaping the course of the narratives of Netflix original TV series; and my clicks, key strokes, and verbal queries help train pattern recognition algorithms for Google.

Platforms as Networks?

In addition to Williamson's dichotomy of markets and hierarchies, organizational researchers writing at the turn of the century emphasized that there was a third mode of coordination — the network.[9] This mode can take many forms: "sub-contracting relationships, research consortia, strategic alliances, joint ventures, and a wide array of activities that fall under the rubric of relational contracts" (Smith-Doerr & Powell, 2005, p. 385), but common to them is that they are "cooperative interfirm relationships" (Kogut et al., 1992, p. 348). With cooperation as the keyword, research indicated, even better that the distinctive character of the network forms is "a *cumulative pattern* of cooperation" (Kogut et al., 1992, p. 349, our emphasis). In this mode, the process of mutual search between buyers and sellers is historical in nature, because it is influenced by their relationship with other firms and by the relationship of these other firms to one another.

At the level of inter-organizational relations, as Grabher and van Tuijl (2020) show, the platform model does evidence some similarities to the network mode, as they leverage networks of firms outside of their corporate boundaries. But their comparison of platforms to Global Production Networks (GPNs sometimes known as Global Supply Chains) reveals more about their differences. Whereas GPNs, for example, typically connect "asset heavy" firms where the problem is "making things," the managerial challenge for platforms is "making matches" (Grabher & Tuijl, 2020, p. 1009).[10]

Among other critical differences are those of temporality, those of trust, those of power, and how these intersect. Time does count in the platform mode — not as long-lasting processes but in choosing the right "moment" to enter and operate. Reputation is scored rather than built through repeated interactions that shape a trusting relationship. Position in the rankings is privileged over loyalty gained by knowing the practical requirements of fewer relational partners (Gandini et al., 2016). Quantity matters more than quality; instant reputation matters more than trust.

8. Sometimes the user is given no choice. Want to hear a track on Spotfiy? You *must* become a member.

9. See Powell (1990), Podolny & Page (1998), DiMaggio (2001), Stark (2001).

10. "By its very nature, in contrast to supplier relationships, the transactions over the platform are not transactions with the platform" (Cutolo & Kenney, 2020, p. 15).

Platform owners are interested in long-term relationships — so long as the long term is on their terms.[11] Instead of the logic of loyalty, they prefer that of lock-in. Missing from much of the work that sees platforms as ecosystems (Kretschemer et al., 2020) is their monopoly character and the transition from collaborative to dependent relationships. The goal of winner-take-most strategies for the platforms is to prevent exit strategies by counter-parties (sellers and buyers, providers and users) whether that be by making it impossible to export one's reputation profile to another platform or by using monopoly power to ensure that so-called "complementors" are locked in to the platform. Among such complementors are the independent developers who create the apps that, in many cases, enable key functionalities for the platform. It is through Application Programming Interfaces (APIs) that platforms like Facebook interact with other systems in a seamlessly interactive network. But as Langlois and Elmer (2013) show for a Facebook API, "rather than connecting them to the Open Web, the API locks both groups [app developers and users] into a landscape defined and controlled by Facebook" (Plantin et al., 2018, p. 30).

Platforms as Platforms

In our view, the platform model is a new form of social organization. *Sui generis*, platforms do not combine Powell's triplicate so much as turn it inside out. As we have argued: i) platforms are of the market but not reducible to it, indeed they may be its anti-market; ii) like hierarchies, they produce power asymmetries, but these are new and outside bureaucratic supervision; and iii) they make property out of network properties, but they substitute timing for trust. Whereas the mode for the market form is *contract*, for hierarchy *command*, and for networks *collaborate*, platforms *co-opt*.

If platforms leverage physical assets, R&D, workforce, salesforce, market research, and the creative energies of customers not by making or buying but by the Möbius strategy of co-opting, are these valuable activities inside or outside of managerial control? What is the management mode of the platform Möbius form? It is to this problem that we turn.

Platform Algorithmic Management

As the closing gestures of the previous section indicated, the Möbius topology of the platform model poses challenges for the management of these activities. If much of the value that the platform captures is created "on the platform" but outside of the corporate core, how can platform operators control the mission critical activities that occur there? An important part of the answer, we think, goes back to a fundamental aspect of platforms with which we opened the previous section: While questioning the idea that it is the market character of platforms that best describes their dominant logic of coordination, we emphatically agree that platforms involve relations that are *multi-sided*. In the platform economy, management and control are manifested in and through a multi-sided relationship.

This relationship is typically three-sided: on one side, the platform *owner*; on the second side, the *provider* (be it workforce, salesforce, musicians, artisans, etc.); and on the third side, the *user-customer* (the buyer, the rider, the listener/viewer, etc.).[12] These roles are obvious to

11. "Whereas a traditional supplier usually signs a long-term agreement that normally includes protections for both sides, the contracts signed with platforms invariably permit unilateral changes and with little or no notice" (Cutolo & Kenney, 2020).

12. In some platforms (social network sites, some music platforms, etc.), advertisers are also added to these actors.

even the most casual observer. We re-state them here because what is not obvious (in much of the research on algorithmic management) is that this triangular geometry (Vallas & Schor, 2020, p. 282) and the power asymmetries along its various axes are key to understanding algorithmic management in the platform economy.

Concisely stated, the managerial challenge produced by the Möbius character of the platform model is addressed by a Möbius answer: In the triangular relationship, *platform owners co-opt the behavior of providers and users* to address the new management challenges. As elaborated in more detail below, the behavior of providers and customers, acting on their own behalf, is enrolled in practices of algorithmic management without managerial authority having been delegated to them. They are not managers, but alongside the algorithms that organize them, their behavior is co-opted for the purposes of algorithmic management.

Yet neither is it the case that providers and users are controlling each other. As we shall see, the ratings of counter-parties are algorithmically translated into calculating devices that circulate through feedback loops also involving the platform operator. These feedback loops are not circular. Instead, they are twisted by the triadic relations of owner-provider-user. Algorithmic management involves a peculiar kind of cybernetic control because at each fold of the feedback loop, accountability can be deflected and denied. Algorithmic management gives a Möbius twist to the cybernetic loop.

Our argument takes its point of departure by comparing/contrasting Taylor's Scientific Management and algorithmic management, presented in three parts — summarized here in catchword formulae: First, on platforms you will find plenty of rules but these are not bureaucratic. Second, (and this more elaborated) you will also find lots of rankings but there are hardly any ranks. Third, there is monitoring aplenty, but often it is not disciplinary.[13]

Rules

One aspect of algorithmic management on today's platforms finds platform operators performing as private regulators,[14] proliferating rules of distinctive character (Frenken & Fuenfschilling, 2020). Although it has been suggested that platforms operate in a "legal void" (Elert & Henrekson, 2016), in fact, the legal framework for activity on platforms is elaborately specified — in the "terms and conditions" to which the member (whether the customer, but even more importantly, the provider/seller) must subscribe (Frenken & Fuenfschilling, 2020).[15] On the supply side, such terms and conditions can run for pages of fine print. But despite their volume and their specificity, these rules are questionably bureaucratic, primarily because such

13. Scientific management is taking place in some parts of the platform's operations, especially where there is no triangular relationship. For example, Amazon's enormous warehouses are extreme examples of algorithmically guided, direct disciplinary control (Delfanti, 2019). That is, algorithmic management can take a different form in the firm than on the platform.

14. See Grabher & König (2020). As Zysman and Kenney (2016) point out, platforms constitute "regulatory structures" that dictate the terms of interaction. Similarly, according to Grabher and van Tujil (2020, p. 1012), platform operators act as "private regulators" and "co-produce their own institutional and societal embeddedness."

15. One would be mistaken to think about these conditions as "terms of a contract." On quasi-monopolistic platforms, terms and conditions are not conventionally contractual: "This extreme concentration results in the contractual obligations regulating the platform-PDE relationship differing markedly from the traditional supplier-buyer relationship. For nearly all platform users, the terms and conditions of participation are non-negotiable" (Cutolo & Kenny, 2020, p. 15).

terms and conditions exhibit little stability.[16] The same is true for the matching protocols and algorithms for evaluating the salesforce (Curchod et al., 2020) and the workforce:

> Workers also experience arbitrary authority when platform companies unilaterally "pivot" (Ravenelle, 2019), changing the structure of the work or the system for compensating and evaluating workers, often without advance notice or justification (Griesbach et al., 2019).

Far from being a source of certainty[17] around which the dependent entrepreneurial developer, the seller or provider can orient, frequent changes in terms, conditions, and protocols are a major *source of uncertainty*.

By this account, platform algorithmic management operates very differently from the scientific management of a century earlier. Although piece rates could change capriciously in a Taylorist factory, the actual introduction of Taylorism on a large scale involved relatively stable rules in the form of productivity bargaining mandated and overseen by the Wartime Production Boards in the First World War (Stark, 1980). Moreover, the maturation of Taylorism in the Fordist and other models of monopoly capitalism by the mid-twentieth century was organized around standardized wage scales and other bureaucratic rules whose goal was predictability. What became known as "internal labor markets" were actually internal bureaucratic rules to reduce market uncertainty (Stark, 1986). On the basis of these rules, workers could use protocols involving measures of skill and seniority (algorithms if you like) to anticipate promotions in pay scales and job ranks.

By contrast, the technical capabilities of algorithmic systems facilitate a form of rational control that is distinct from the technical and bureaucratic (Kellogg et al., 2020, p. 366) or normative (Rahman, 2020) control used by employers in the past. In platform monopoly capitalism (Vertesi et al., 2020), the goal of the perpetual recoding of the institutional fabric, the shifting evaluation criteria, and the unpredictable "updates" of terms and conditions is the production of uncertainty. The ongoing generation of such uncertainty — whether by instability (Frenken & Fuenfschilling, 2020) or opacity (Curchod et al., 2020; Rahman, 2020) — is a source of non-bureaucratic control.[18]

Non-bureaucratic means of control are important because, as Hatim Rahman emphasizes, "platforms theoretically (and legally) cannot subject workers to control measures of the past" (Rahman, 2020). To do so, would damage the platform owners' claim that the drivers and other agents who provide their workforce, the musicians and artists who provide their creative teams, the dependent entrepreneurial developers who provide their R&D arm, and the sellers who, in effect, provide their salesforce, and so on, are independent contractors.

16. Frenken and Fünfschilling (2020) argue that the specificity of platforms rests on their "re-coding capacity," i.e., it is not just that they create their own rules but that they are capable of adapting them quickly to the changing context. "Just as their technological capacities evolve through changes in the software codes, so do platforms evolve — or better 'recode' — their formal institutional embedding through ongoing adjustments in their terms and conditions (...) The re-coding capacity provides platforms the ability to continuously adapt the course of institutionalization in a largely autonomous manner" (Frenken & Fünfschilling, 2020).

17. Kreiss, Finn and Turner (2011) point out that, in the urge to get rid of the iron cage, we also risk losing the valuable elements of bureaucracy, forgetting that stable rule systems replaced the irrationality of traditional forms of domination such as monarchies.

18. In Rahman's (2020) terms, "from the iron cage to the invisible cage."

Ratings and Rankings

Taylorism involved an ecology of devices. In fact, much of the materiality of Taylorism — its stop watches, time sheets, and stroboscopic cameras, as well as its calculating protocols — showed algorithmic aspects.[19] The algorithmic management of platform capitalism also consists "of an ecology of accounting devices in the form of rankings, lists, classifications, stars and other symbols ('likes', 'links', 'tags', and other traces left through clicks)" (Kornberger et al., 2017, p. 3).

But whereas the assemblage of people, devices, and procedures that was Taylorism took place as part of the creation and maintenance of a system of hierarchical supervision, the assemblage of people, devices, and protocols that is algorithmic management takes place in a system where feedback loops are twisted rather than circular. Triangular rather than vertical, the lines of vision in algorithmic management are not those of a panopticon — and, strictly speaking, are not supervisory.

Ratings. One of the most important devices in the "evaluative infrastructure" (Kornberger et al., 2017) of algorithmic management, ratings offer feedback about performance. Unlike employee evaluations by line managers (in a conventional corporate setting) or 360° evaluations by co-workers (in a post-bureaucratic setting), these ratings are by the counter-parties to the transaction. Familiar to all of us from daily life, ratings can involve written comments but are frequently simple numerical scores (or graphic representations of such) or, when binary, indicators (thumbs ups/down, "likes," reposts, retweets, and the like) that can be added up to yield a score.[20] These ratings can serve as feedback to inform providers about their own performance of various forms; and, importantly, these performance metrics are frequently available to other users.

Of course, such performance metrics are always available to the platform operator; in fact, some platforms will exclude or punish provider/users based on their ratings by others.[21] Even without being examined by (or aggregated into rankings by) the platform operator, user ratings can influence the *provider's behavior* because users' accessibility to ratings can influence *customers' choices*. As Orlikowski and Scott (2012; 2014) demonstrated in an early and important study of TripAdvisor and as Curchod et al. (2020) show in their study of eBay, online evaluations generate a sense of anxiety and vulnerability.[22]

19. One of the interesting consequences of comparing Taylorism and algorithmic management is that the comparison reveals aspects of the former. It's often stated that many procedures involve algorithmic features (a cooking recipe, for example). But there is a non-trivial sense in which Taylorism had algorithmic characteristics. This was certainly so for the system of "Motion Studies" by Frank and Lillian Gilbreth. Created as an alternative to the "Time Studies" of classical Taylorism, the Gilbrethian system replaced Taylor's stopwatch that depended on the cooperation of the workman with the movie camera in a kind of laboratory setting. Micromotion study involved filming human activities, analyzing these by breaking movements down to isolate the times of specific micromotions, and cataloging these elementary motions — the times of which could be added up to derive the standardized time to carry out a particular activity. Through such microanalysis the Gilbreths thereby created an algorithmic system, what we might now call a database of elementary motions.

20. For a pathbreaking analysis of "the like economy," see Gerlitz and Helmond (2013).

21. For an analysis of deactivations at Uber, see Rosenblat (2018).

22. On hostile practices by the customers including forms of black-mail, see Curchod et al. (2020), who write, for example, about eBay: "Sellers are anxious that one evaluation too many might automatically trigger a status downgrade. The frustration and anxiety sellers experience are partly due to a feeling of being surrounded by things rather than people and hence being unable to communicate and justify their actions" (Curchod et al., 2020, p. 667).

Rankings. As mentioned, ratings are typically scores. Of great importance for algorithmic management is that a rating (or set of ratings along different dimensions) can be readily aggregated and translated into a ranking (Stark, 2011). Whereas a rating is understood as judging something as better or worse than a standard, a ranking is immediately grasped as assessing something as better or worse than some other — even when the ranking was produced neither with reference to any standard nor with any head to head comparison between the actors/objects ever having been made.[23]

Rankings matter because much of the platform economy is an *economy of attention*. Not just sellers but nearly all types of users are competing for attention. Whether to be chosen for purchase or to be available for "a match" one must be seen. On many platforms visibility is a direct function of where the offering, provider, or the user sits in the ranking. The visibility produced by rankings is especially important because the numbers of offerings or potential matches on platforms is truly staggering. Even when the offerings presented in the ranking are restricted by genre or some type of categorization, the numbers are often likely to be vast.[24] The specific number can vary by platform. But whether it be 10, 110, or 1,010, below a certain position in the ranking you might just as well be invisible.[25]

In the competition for attention, platform players compete for position in the algorithmic rankings. This position is determined by the aggregated ratings of other users — sometimes ratings by direct counterparties, sometimes even by other providers (think, for example, of likes and reposts on cultural platforms).[26] Such competition is less like market competition than it is like organized *competitions*. But the competitions on platforms are not like athletic competitions, music competitions, or architectural competitions occurring within a discrete time and specific place, with competitors registered at the beginning and winners announced at the end. Taking place almost anywhere, nearly anytime, perhaps even all the time, rankings are ongoing, endlessly updated.[27]

The rankings of online platforms are not like the awards and prizes of conventional competitions (Espeland, 2020). The winner of an Olympic event is, for all times, an "Olympic gold medalist." But a provider ranked Number 8 on some list might fall out the Top Ten in the next ranking, whether that be in the next year, the next month, or the next day. And the

23. See Esposito & Stark (2020) and Stark (2020). On the relational, as opposed to referential, character of algorithmic evaluative infrastructures, see Kornberger et al. (2017, pp. 11–13).

24. To give some examples: if you are looking for accommodation in a large city, Airbnb might communicate that "there are more than 300 accommodations for the requested dates" (a standard formula) and then propose them in the order of priority established by the algorithm. If you are looking for a glass or a fork on Amazon, it offers you the first 48 results "over 70,000" (a standard formula, again).

25. See Bucher (2012). Ranking is also important for the visibility of scholarly output. Of course, you would never buy a book based on its overall sales ranking on Amazon. Nonetheless, you might unconsciously rely on rankings to guide your reading. If you use Google or Google Scholar to search for a paper on a given topic, especially in a field in which you are not expertly familiar (say, "network centrality measures" or "performance studies"), your attention will be directed to a ranking organized algorithmically based in large part on citation counts. Evans (2008) shows how the resulting pattern of attention speeds up search but narrows the diversity of exposure.

26. For the most part, what platform operators do is to organize competition. But sometimes they deliberately manipulate the rankings. The consultation that led to "Ranking transparency guidelines in the framework of the EU regulation on platform-to-business relations" (Regulation EU 2019/1150) showed that one of the major difficulties businesses have in their relationship with online platforms is arbitrary and discriminatory changes to search algorithms made by online platforms with little or no warning or explanation.

27. For more on competition and competitions (as well as on the differences between discrete liberal competitions and the continuous "Illiberal" competitions of online platforms, see the essays in Stark (ed., 2020).

difference between being in or just out of the Top Ten can be consequential even if the ordinal move is very small (Stark, 2020). On many platforms, rankings are not episodic (yearly, for example) but are being algorithmically updated almost continuously. Algorithmic control, in these cases, does not mean that the user/provider is under 24/7 direct surveillance monitoring but that their behavior, the evaluation of this behavior by others, and the translation of these third-party evaluations into a ranking that can be fed back to affect their behavior is happening all the time.[28]

Rank orderings can be explicit; but oftentimes the ranked list is not explicitly presented as such. This is frequently the case on cultural platforms, where Bonini and Gandini (2019) speak of a "new regime of visibility." Of particular interest is the changing role of rankings in the field of music consumption where algorithmic rankings (and the control that accompanies them) take new forms responding to new products and services.

Practices of curation figure prominently in music, as in other cultural fields; and lists figure prominently in curation. Whether on the radio or now on music streaming platforms, curation is the distinctive service provided to the listener[29] — and the ranked list was and remains the basic, curated format. Of course, that format has evolved considerably.

Top 40 lists set the agenda for AM radio and hence the consumption habits of pop music listeners. And, if the character Rob Fleming, the indie record store owner in Nick Hornby's (1995) novel *High Fidelity* was true to life, then Top 10 lists of albums were no strangers to FM listeners as well.[30] Where the record single release was the basic sales unit of AM radio, and the album the basic unit for the FM field, today's online streaming platforms have unbundled the album and rebundled releases to *create a new product*: the playlist (Bonini & Gandini, 2019, p. 2; Prey, 2020a, p. 3). Thus, whereas Top 40s or Top 10s were ranked lists of products (releases/albums), *today the product* (the playlist) *is itself a ranked list*.

Users of Spotify or other music streaming platforms, doubtless familiar with playlists, might be perplexed that we refer to playlists as ranked. Platform operators, labels, distributors, and musicians would not be surprised at all. We are not referring to the playlist you or your friends make (at Spotify, for example, numbering in the billions) but to the playlists generated by the platform operators. Although the major labels do have their own playlists on Spotify to promote their artists, it is the Spotify-generated playlists that overwhelmingly dominate playlists on the platform.[31] Each platform has its own proprietary software for data analytics. The PUMA (Playlist Usage Monitoring and Analysis) program, for example,

> breaks down each song on a playlist by things like number of plays, number of skips, and number of saves. PUMA also tracks the overall performance of the

28. On the non-disciplinary character of illiberal competitions see especially Davies (2020). In a thoughtful study of performance metrics and algorithmic management emphasizing the role of rankings, sociologists Olav Velthuis and Niels van Doorn (2020) document the daily, even hourly, updating of rankings of the (literal) performances of sex workers in an online platform.

29. See Prey, 2020a. Bonini and Gandini (2019, p. 3) date late 2014 as the "*curatorial turn*" — not because this is the first curatorial moment in the presentation of music but because it was the moment when Spotify adopted the role of curator by moving from simply streaming music to generating playlists.

30. Rob Fleming (the character played by John Cusack in the movie with the same title) used the format of Top 5 lists as a way to organize the elements of his private life and his self-image.

31. "The top Spotify-curated playlist — the algorithmically generated 'Today's Top Hits' — counts over 22 million followers. The 35 most followed playlists on Spotify (as of January 2019) were all Spotify-curated playlists; as are 99 of the top 100 playlists" (Prey, 2020a, p. 3). "Spotify's curated lists have over three quarters of the followers of the top 1,000 playlists" (Aguiar & Waldfogel, 2018, p. 8).

> playlist as a whole, with colorful charts and graphs illustrating listeners' age range, gender, geographical region, time of day, subscription tier, and more (Pelly, 2017, quoted in Bonini & Gandini, 2019, p. 6).

The genre or mood-specific playlists ("RapCaviar," "Soul Coffee"), playlists for individual artists ("This is Lang Lang"), and the personalized playlists algorithmically created[32] for individual users (such as "Discover Weekly," "Your Daily Drive," and "Release Radar") do not appear as numbered lists. But the order of the tracks in a ranking is known to the platform operator (since placement in a ranking is a major factor determining whether the release is on a playlist at all). Most importantly for artists and labels, location on the discretely ranked playlist directly shapes listening and revenues — with positioning near the top of the playlist having the greatest impact:[33]

> Music artists and record labels are growing increasingly dependent on plum playlist positions — playlists controlled by Spotify. For platforms such as Spotify or YouTube who do not own the rights to their own content, playlists are a key mechanism through which to exert what we can call "curatorial power" (Prey, 2020a, p. 3).

By dominating the playlist game, platform operators are now attempting to use artists' dependence on inclusion and ranked location in playlists to improve platform profit margins, limited to date, by the major recording labels to which the platform must pay streaming fees. Spotify, for example, is offering significant advances to independent artists to license their music directly to the platform. According to *Billboard* "[s]ome acts say they are tempted to sign direct deals with Spotify not just for the advance fee and the higher potential payouts per stream, but for the prospect of better placement on top playlists" (Karp, 2018a, cited in Prey, 2020a, p. 7).[34]

From Disciplinary Supervision to Non-supervisory Visibility

When referring to the explicit rankings (or the disguised rankings such as playlists) of algorithmic management as a "new regime of visibility," we were speaking to the ways in which ordered

32. Playlist creation often involves algorithms and humans: "Instead of contrasting editorial and algorithmic logics, we should thus frame these logics as stacked and entangled, both shaping the outputs of platforms. These are always present together, but with different weights. Each platform articulates these logics by giving them a different relevance. In some Spotify playlists, the algorithmic logic weighs more, while in other playlists, editorial logics are more relevant." (Bonini & Gandini, 2019, p. 6).

33. "The European Commission study determined that a track placement on Spotify's"Today's Top Hits" playlist resulted in up to US$ 163,000 in additional revenue. Other popular Spotify- curated playlists resulted in an even higher payout: "Viva Latino!" was found to generate between US$ 303,047 and US$ 424,265 in added revenue per track (Aguiar & Waldfogel, 2018)." (Prey, 2020a, p. 3).

34. Noting that Netflix is often cited as a model of a platform moving from distributing cultural content to producing it, Prey (2020a) points out that the recorded music industry is considerably more concentrated than the television and film industries with the three major music companies controlling an overwhelming proportion of Spotify's streamed content. Pushing too fast and hard to sign artists' directly could risk retaliation by one of the major labels; yet profit margins are so thin, and investors are eager that the platform incrementally position itself as a content producer. Spotify's stock price is likely to move together with victories/failures in the playlist battles.

lists brought actors to the attention of others in the platform economy. But some might consider that the tools of algorithmic management point to a different kind of visibility: subordinates in a visible cage subject to a new and even more ubiquitous managerial gaze. This perspective sees algorithmic management as the new disciplinary panopticon. Such a view is adopted, for example, in the study of eBay by Curchod et al. (2020, especially pp. 665–667). But, from their insightful observations about asymmetries of power between evaluators and the evaluated at the interactional level and between sellers and platform owners at the structural level, we do not draw the conclusion that these "power asymmetries stemmed from eBay's capacity to impose sanctions and rewards through *highly bureaucratic*, automated practices" (p. 656, our emphasis), or that eBay "relied on evaluations as a bureaucratic mechanism for the exercise of power" (p. 660), or that its "sellers are situated in a formal, hierarchical power structure" (p. 666).

Platform organizations are, indeed, powerful, as we argued emphatically in the previous section. Moreover, the scopic properties of algorithmic management — simultaneously registering in a very large scope while also making intimate details visible — are indeed extraordinary. In contrast to Curchod et al. (2020), however, platforms demonstrate that centralized power can be decoupled from direct disciplinary control.[35] In platform algorithmic management, control is decentralized and distributed (Kornberger et al., 2017; Vallas & Schor, 2020).[36]

Of course, bureaucracies also distribute control: bureaucratic supervision is distributed hierarchically (an actor in a bureaucratic hierarchy can supervise other actors below and be supervised by others placed higher in the hierarchy of authority). When we say that control in algorithmic management is decentralized and distributed, we do not mean to suggest that *bureaucratic authority* has been distributed in a more decentralized way. Algorithmic management is not organized around bureaucratic authority, neither conventionally nor algorithmically.

In the triangular algorithmic model, platform owners relinquish supervisory control (Kornberger et al., 2017, p. 3; Vallas & Schor, 2020, p. 282) in favor of enrolling the behavior of the other two parties to the exchange. It is this behavior that functions as inputs for algorithmic management.[37] Though not part of the management team, buyers and sellers are, nonetheless, a critical part of algorithmic management.

It follows that algorithmic management *does not automate bureaucratic structures and practices*. The problems it deals with are not bureaucratic problems to start with and the answers are not some new form of algorithmic bureaucracy. The inputs for the ratings and rankings and numerous other non-bureaucratic accounting devices of algorithmic management are produced by interactions in the triangular relationship, and the outputs — performance metrics — are accessible to the second and third parties themselves (at least partly and often with considerable opacity).

When speaking of the behavior of these second and third parties as being involved in the

35. Power "lies in the number of users and big data, rather than in the ability to discipline and control individuals directly" (Kornberger et al., p. 12).

36. In Amazon warehouses (Delfanti, 2019) and at the delivery platforms Instacart and Deliveroo centralized power can be coupled with "algorithmic despotism" (Griesbach et al., 2019; Woodcock, 2020).

37. In their study of eBay, Kornberger et al. (2017) provide an excellent example of reliquishing control. As they demonstrate, the problem of reputation was among the most (perhaps the single most) critical issues for the online marketplace platform. eBay refused to adjudicate reputation. "The evaluative infrastructures created to solve this problem provided a means of distributing the task of management that had originally and painstakingly been undertaken in-house" (Kornberger et al., 2017, p. 8).

practices of algorithmic management, we deliberately use the language of *enrollment* (Latour, 1987; Callon, 1999). Workforce and users, salesforce and customers, are acting on their own behalf, not as the agents or the delegates of platform management. We prefer enrollment because "delegating"[38] could suggest that the same supervisory activity has now been assigned to other actors. Similarly, it might suggest that, because authority has been delegated to them, they are now accountable to platform management.

Broad changes in patterns of accountability can be seen in three historical configurations since the mid-twentieth century, corresponding to mass production, collaborative production, and platformization.

Table 1: Historical Patterns of Management, Visibility, and Accountability

	Mid 20th Century Mass Production	**Late 20th Century Collaborative Production**	**Early 21st Century Platformization**
Management	Scientific	Project-Based	Algorithmic
Visibility	Vertical	Lateral	Triangular
Accountability	Hierarchical	Heterarchical	Deflected

Taylorism was robustly hierarchical — not only in its location within a hierarchy of managerial promotion and accountability, but also in its sequential engineering and in its embedding in a *conceptual hierarchy* in which exhaustive and exclusive categories are organized from the particular to the general (Stark, 2009). Algorithmic management operates according to a different logic. Without the verticality and the sequential engineering of the mid-Twentieth century corporation, its databases are not categorical but relational. Algorithmic management differs as well from the project management of high-tech startups in which cognitively distant team members look to each other for lateral coordination rather than compartmentalization (de Vaan et al., 2015). Without the horizontality and the simultaneous engineering of project management in the late-twentieth century startup,[39] in the platform economy some are algorithmically surveilled while others compete in the rankings for algorithmic attention.

In the corporate world of mid-twentieth century capitalism, as in other hierarchical settings, accountability was vertical. In the post-bureaucratic firms of the end of the century, in high-tech start ups and inside projects in otherwise corporate firms, multiple evaluative principles co-existed. In this heterarchical form, accountability was lateral, eloquently expressed by a young interactive designer in Manhattan's Silicon Alley when asked to whom he was accountable in the new media startup: "I'm accountable to everybody who counts on me" (Stark, 2009, p. 23). In the algorithmic management of the platform economy, accountability (like the lines of visibility) is neither vertical nor lateral. The counter-parties are not accountable to project operators; although they evaluate each other through all kinds of devices and must take these accounts into account, they are not accountable to each other; and project operators are certainly not accountable to their workforce/salesforce or users. Evaluations and ratings abound, accountings are plentiful, but no one is accountable because there is no accountability in algorithmic accounting.

38. The term "delegating" is from Vallas and Schor (2020, p. 282) with whom we are otherwise in quite strong agreement about the platform governance mechanism.

39. On sequential versus simultaneous engineering, see Sabel and Dorf (1998) and Stark (2009, esp. pp. 21–23, 99–101).

Class Structure and the Political Models of Platform Monopoly Capitalism

Class Structure, Class Composition

In this final section, we briefly gesture to the implications that our analysis has for class and politics in platform monopoly capitalism. In terms of class structure, the algorithmic management of our century can be instructively compared to the Scientific Management movement of a century ago. Although Taylorism is typically understood as an instrument of capital in its dominance over labor (Braverman, 1974), this two-class model fails to explain the introduction and spread of Scientific Management because it ignores how Taylorism was a new class project. Led by Frederick Winslow Taylor, Scientific Management laid out the founding principles for the practices and the ideology of a *new knowledge class*. The transformation of the labor process was a multi-sided class struggle among labor, capital, and this emerging new class (Stark, 1980).

At the forefront of the movement were industrial and mechanical engineers who adopted and modified the practices of scientific management to advance their class interests as a leading part of the rapidly expanding ranks of managers. Their legitimating claims were neither ownership of capital nor the labor theory of value. Instead, Scientific Management based its legitimacy on knowledge claims. On that basis it was the ideological spearhead of the new class of managers and professionals. One does not need to accept its claims of objectivity and scientificity to recognize that this was a powerful ideology for a class that swelled throughout the twentieth century.

If Scientific Management contributed to (or, at the very least, corresponded to) the rise and growth of managers, what are the likely effects of algorithmic management on class structure/class composition? What are the class interests of the new social engineers? How do they differ from those of the new knowledge class of a century ago? And how are they congruent or in conflict with those of the platform owners? These are questions deserving of comprehensive treatment. We gesture here to some lines of investigation for further research.

Whereas industrial and mechanical engineers figured prominently in Scientific Management, the engineering base of algorithmic management is among software engineers and data scientists. More computational than the Taylorists and their followers, the tests conducted by these engineers are more likely to be testing fundamental questions about sociality (what are the network properties of trust? for example, or what is the meaning of a social tie?) than of ergonomics (Marres & Stark, 2020). The data scientists and software engineers are, indeed, engaged in a new project of social engineering.

Claims to objectivity and scientificity mark a strong line of continuity linking scientific and algorithmic management across the centuries. Our analysis has emphasized the differences. Whereas Scientific Management was bound up with a project of bureaucratic supervision and the growth of a managerial class, algorithmic management is not bureaucratic, and its ascendance is reshaping the composition of the knowledge class. That is, based on our analysis, there are reasons to think that the growth of the platform economy and the spread of algorithmic management will be accompanied by a marked decrease in the ranks of management. Algorithmic management is not automating bureaucracy. It is not doing bureaucracy algorithmically. Nonetheless, the algorithmic triad will be putting managers out of work (Enriquez & Vertesi, 2020). This is an empirical question. A related hypothesis would suggest that algorithmic management accompanies an overall, although slower, decline in management while marking a dramatic change in the proportion of line and staff management, strongly favoring the latter. These are research questions for further investigation.

Completing our comparison, if Scientific Management was a movement led by mechanical engineers, who are the leading spokespersons for algorithmic management? Does it come from data scientists and software engineers? For Scientific Management to become widespread, the Taylorists had to make compromises on both sides of the class divide, accommodating to the owners of industry by curtailing their ambitions and accommodating to labor by productivity bargaining (Stark, 1980). What are the lines of conflict and congruence between the big data scientists and the platform owners? Here, too, are questions for further research.

Societal Coalitions

In closing, we turn to politics. Any analysis of the political model(s) of platform capitalism, even one as brief as the outline we sketch here, must begin with how the term itself — platform — plays a role in the legitimating ideology[40] of platform dominance and in its political alliances. As Gillespie (2010) so persuasively demonstrates, the term *platform* evokes many connotations — a software operating system, a base to build on, a raised architectural element, a subway platform, a political platform, a place to take a position or express oneself, and more. According to Gillespie, the notion of platform is "specific enough to mean something, and vague enough to work across multiple venues for multiple audiences" (Gillespie, 2010, p. 349).[41] Common to the various connotations, however, platforms are typically flat and open to all: "In any of *platform's* senses, being raised, level and accessible are ideological features as much as physical ones." Suggesting "a progressive and egalitarian arrangement, promising to support those who stand upon it," the term thereby "retains a populist ethos" (Gillespie, 2010, pp. 350–351).[42]

If the platform speaks to disparate audiences with a singular language and is open in terms of accessibility, this metaphorical flatness belies asymmetries of power among the actors. It is a solid and not a plane geometry. In the current conjuncture, how do these asymmetries result in dominated participants, how do they yield coalitions at the platform level, and how do these relate to coalitions at the societal level?

In a reprise on the theme of visibility, we return to the research on eBay by Curchod et al. (2020), focusing as it does on patterns of visibility. Whereas the track records and details

40. A comprehensive analysis of the legitimating discourse of platform capitalism would need to highlight the prominence of what Boltanski and Chiapello (1999) refer to as the "connectionist" order of worth, keying, for example, on the role of "matching" in the platform discourse.

41. Gillespie's idea of a discursive positioning that makes it possible to be interpreted in multiple, even disparate registers is similar to Padgett and Ansel's (1993) notion of "robust action." See also, Star and Griesemer's (1989) concept of "boundary object." In Stark's summary, a boundary object "must be stabilized enough to circulate across sites, yet plastic enough to adapt to the local constraints and needs of the disparate parties deploying them. Robust enough to be recognized in different settings, boundary objects are recognized by the different communities in distinctive ways" (Stark, 2009, p. 194).

42. The self-presentations of platform billionaires are typically either as "geeks" or as "regular guys." Whether, for example, they dropped out of Harvard (Bill Gates and Marc Zuckerberg), graduated from Princeton and got degrees in electrical engineering and computer science (Jeff Bezos), or were in the computer science PhD program at Stanford (Sergey Brin and Larry Page), some of the founders of early platforms offer (rightfully or wrongly) geek associations tying them to the technical elite. Other, more recent, founders offer themselves in more populist guise. For example, the founding myth of Airbnb goes back to 2007 when the founders were traveling to a conference but lacked funds to pay for lodging. They decided to rent out part of their apartments to cover the cost of the trip. This sparked their idea. The same for BlaBlaCar: Fred Mazzella could not find a seat on the train to reach his hometown for Christmas and realized there were plenty of empty seats on cars going in the same destination, but he could not access them. In these cases, they had encountered (supposedly, "like you and me"), some annoying problem in trying to get things done; they found a solution, and they now share that with us.

of *sellers* were visible to all, "online evaluations enabled *buyers* to keep their track record hidden, their identity private, and their direct e-mail confidential" (p. 656, our emphasis). The anonymity and invisibility of the buyers corresponds to a power asymmetry *favoring buyer over seller at the transactional* level; and the stance of indifference and distance on the part of the platform corresponds to a power asymmetry *favoring platform operator over seller at the governance* level. As outcome, Curchod et al. (2020, p. 665) observe an "isolation of the visibles" (the sellers) and identify a "coalition of the invisibles" (buyers and platform owner). This coalition of platform operator and customer would not be unfamiliar to the participants dominated on other platforms, be they drivers at Uber, musicians on Spotify, artisans on Etsy, or the dependent complementors on many platforms (Huws, 2014; Schor, 2020).

If organizational researchers identify a coalition of interests between platform owners and customers at the platform level, what coalitions do political economists find at the societal level? In an exemplary article, one of political economy at its best, K.S. Rahman and Kathleen Thelen (2019) provide an answer, especially interesting because they make almost no reference to research at the organizational level.

Rahman and Thelen situate their analysis of the rise of the platform model in an historical account, identifying three main phases in the evolution of capitalism over the past one hundred years. The mid-twentieth century model involved a "nexus of reciprocal relationships" between industrial megafirms (such as General Motors and General Dynamics) and their stakeholders, geared towards stable long-term growth, based on large workforces with permanent employment contracts and underwritten by patient capital. This model broke down in the late twentieth century, replaced by a "network of contracts" in which stock price was the core metric of success. For companies such as Nike, the pressure of investors favored aggressive outsourcing and labor-reducing strategies to face price-based competition among producers. The new platform-based firms of the business model in the third period are backed by a different type of investor: "unlike the 'break it up and sell it off' mentality of the 1990s, the financial interests behind firms such as Uber and Amazon are in it for the long haul" (Rahman & Thelen, 2019, p. 180).

In each phase the business model rests on a different political-coalitional foundation: whereas the mid-century model was based on a coalition of managers and stakeholders (including labor), the shareholder revolution of the late twentieth century was organized around a coalition of managers and investors; today, the twenty-first century platform model is built on an alliance between firm owners, investors and consumers. "Consumers are enlisted — either explicitly or, more often, implicitly — in the political alliance against labor" (Rahman & Thelen, 2019, p. 181). Moreover, because of their unprecedentedly close relationship to the consumer, platform firms can use the consumer to influence regulatory policy.[43] This very direct, almost unmediated, connection to the user makes possible the "explicit weaponization of the user base in political battles with regulators" (Rahmen & Thelen, 2019, p. 185).

Rahmen and Thelen's observations about politics are congruent with our observations at the platform transactional level as well as those about the expected effects of algorithmic management on class structure/composition. Together, these make it clear that the "customer obsession" declared by organizational doctrine on platforms like Amazon is far more than a mere marketing strategy: consumers (unwittingly) produce value through their data, consumers re-

43. Van Doorn (2020) analyses the ascendency of "regulatory entrepreneurship" and in particular Airbnb as a urban regulatory entrepreneur, "a company for which changing the law forms a material part of its business plan" and users as both a scalable political workforce and also regulatory entrepreneurs in their own rights.

place (at least partially) management in the evaluation of workforce/salesforce, and consumers act as a political voice in favor of the platforms.[44]

How stable is the political business model of consumers in coalition with platform owners/investors? Is it a temporary conjuncture or is it likely to be sustainable in the long run?

Starting by challenging the idea that there is one platform political model, research to address these questions will examine important differences in the American, European, and Chinese models (Peck & Phillips, 2020). The United States has very particular political and regulatory features, which as Rahmen and Thelen recognize, made it likely to be the hothouse for platform growth. But China also has very distinctive political features — significantly different from the USA — which also have produced an enormous platform sector. In identifying coalitions there, a strong candidate would be a coalition of platform operators and the Chinese Communist Party (and its national and regional governments) (Plantin & De Seta, 2019; Jia & Winseck, 2018; De Kloet et al., 2019). The European regulatory system is entirely different yet again and perhaps a reason why there are relatively few large platforms with European headquarters (Peck & Phillips, 2020).

In the initial years in the United States,[45] patient investors did allow platforms to cross-subsidize providers long enough to create network effects and achieve winner-take-most standing. With such subsidization, platforms could offer incentives to providers, who themselves made investments (for example, drivers who bought cars, or hosts who renovated apartments) to improve their position on the platform. With a solid base of providers, the platforms concentrated their energies on expanding the consumer base. And, once a position of dominance was achieved — as has already happened in "first generation" platforms such as Amazon — platforms move laterally, expanding into new sectors. In this situation, platforms no longer need to subsidize providers[46] — who are now vulnerable to capricious changes in service conditions and whose personal investments are at risk[47] — yet the platforms must keep the customer base large. Hence the alliance with the consumer.

On the regulatory front, platform owners did maneuver around and through regulatory ambiguities (or simply ignored and broke existing regulations) until they could gain loyal consumers who would support them to secure favorable regulation (Thelen, 2018; Culpepper & Thelen, 2020). What could undermine this alliance? In the current situation, moments of overt political conflict between platforms and the citizen/consumer have involved activities where platforms generate negative externalities on a social level. For example, some municipal-

44. According to Thelen (2018) this coalition between consumers and investors / platforms owners explains the different regulatory response also between countries with the same model of capitalism: "if the"varieties of capitalism" framework fails to explain these outcomes, more purely political arguments — based on an electoral logic — might be brought to bear. The political economy literature tends to emphasize interest group politics, possibly overlooking dynamics that are rooted instead in the incentives that politicians face as they confront citizens as voters and as consumers" (Thelen, 2018). This approach proposes an important reversal of perspective with respect to political economy: it does not look at the voters who consume but at the consumers who vote.

45. Many of the platforms at the core of our analysis were founded in the years following the 2008 crisis. In those years, investors were looking for new opportunities, the workforce and salesforce needed new markets, and consumers had little money but wide aspirations.

46. Rahman and Thelen (2019) might have over-estimated the extent of investor patience. Perhaps pressures by shareholders for cost-cutting measures are among the factors leading to practices that come at the expense of the workforce/salesforce.

47. Moreover, in some sectors, automation strategies make providers less and less relevant. In some cases, providers even involuntarily collaborate in their own replacement (Vertesi et al., 2020).

ities — including cities such as Barcelona — have restrictively regulated Airbnb, responding to citizens who, as long-term renters, were aggrieved by Airbnb's effects on the housing market. That is, such cases effectively shift regulatory attention from a focus on the interests of the platform customer to larger societal interests, albeit to date at the municipal or regional level.[48]

The antitrust regulations of twentieth-century capitalism were built with a rhetoric of consumer protection. Antitrust regulations in the twenty-first century might yet be built on such a rhetoric, but in the foreseeable future platforms' expansion into new sectors will require that they continue to mobilize consumer support.[49] An alternative is that antitrust regulations to curb monopoly platforms will be built on different principles — societal rather than consumer protection.

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48. Culpepper and Thelen (2020) argue that the capacity of companies to enlist consumers as allies depends on having sufficient concentrations of them in a relevant voting jurisdiction. Thus it matters whether a platform service is consumed by locals (as in the case of Uber) or instead by visitors (Airbnb) to whom local politicians may not feel particularly beholden. Politicians are more likely to bend to platforms where the platform's users are their own voters, which helps to explain why mayors across a range of cities in different countries have imposed more regulations on Airbnb than Uber.

49. US-based platforms might also be expected to need consumer/citizen support for policies that minimize the threat of competition by powerful Chinese-based platforms.

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The Platform Conjuncture

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Abstract

The paper engages the problematic of platform capitalism in the company of Fernand Braudel. Platform capitalism is accordingly located in the opaque zone of the so-called antimarket, "where the great predators roam," with its characteristic conditions of monopolization, concentrated economic and political power, and cultures of systematic regulatory evasion. The Braudelian schema requires that platform capitalism is situated, both historically and geographically, in this case both as a distinctive conjunctural moment and as an epiphenomenon of variegated and globalizing processes of financialization and neoliberalization. The paper offers an antidote to the mainstream treatment of platforms, with its technological exuberance, its preoccupation with internally generated dynamics, and its exaggerated claims to novelty and indeed revolutionary significance. Thinking conjuncturally about platform capitalism *qua* Braudelian capitalism does not just counter these problems, it represents a constructive supplement to extant political-economy accounts. It accentuates and problematizes non-repeating historical continuities (against presumptions of a radical technological-organizational break). And it points to constitutive conditions of coexistence (against the imaginary of a separate, self-propelling, and distinct innovation economy). To pose the platform question along with Braudel is to begin with problematics of monopoly power and antimarket behavior, rather than with technological affordances, network capacities, or the market.

Keywords: Platforms; capitalism; monopoly; market; antimarket; Braudel.

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This paper began life as a sympathetic rejoinder *cum* supplement to Grabher and König's (2020) post-Polanyian treatment of platform economies, subsequently morphing (somewhat to our surprise) into a more extended thought experiment around the potential of the Braudelian framework. We are grateful to Ivana Pais and David Stark for the invitation that prompted this paper, and to Ester Cois for her assistance. Thanks also to Brett Christophers, Neil Coe, Albina Gibadullina, Gernot Grabher, Mark Graham, Paul Langley, Matt Vidal, Henry Yeung, and anonymous referees for *Sociologica* for their advice and suggestions, although none bear any responsibility for our arguments here. The support of the Social Science and Humanities Research Council of Canada is gratefully acknowledged.

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1 Introduction: Confronting Platform Capitalism

In this paper we make common cause with those developing critical readings of platform capitalism from vantage points grounded in heterodox political economy. This work has provided a much-needed antidote to some of the most problematic features of mainstream commentary on the platform moment, with its self-regarding technological hubris, its excitable assertions of unprecedented novelty, and its tendency to minimize both historical precedents and constitutive conditions of (co)existence with financialized capitalism. Political economists of various stripes have offered a series of alternative interpretations, many of them highlighting the remarkable powers and extensive reach of Big Tech, the pervasive exploitation of gig workers and other so-called independent contractors, the routine circumvention by platform corporations of regulatory frameworks and taxation systems, the everyday abuses of market power, and much more.

In one such alternative account, recently published in this journal, Grabher and König (2020) mobilize a post-Polanyian approach to cut a distinctive and productive path between binary readings of the platform-mediated future, which have become polarized between sunny premonitions of a post-capitalist "sharing economy" and grim portents of an uber-capitalist condition of undiluted corporate rule. Working creatively with the Polanyian legacy, Grabher and König make the case for a substantivist engagement with platforms as "emerging modes of socioeconomic coordination that cannot be mapped onto the existing register of governance mechanisms," tracing the roots of the platform economy to a "complex alchemy of political, societal, institutional, and technological ingredients" (Grabher & König, 2020, pp. 96–97). They deflate the bubble of techno-futurism that has done so much to obfuscate assessments of this significant phenomenon, while also deconstructing pervasive discourses of "revolutionary" disruption. Yet there is an aspect of their framing question — post-capitalism or uber-capitalism? — that promptly recedes from view: the question of *capitalism* itself. Now, Polanyi's own critique of capitalism was also incomplete in some respects, notwithstanding his significant contributions to the understanding of marketization, liberalization, and socioeconomic transformation (see Peck, 2013; Block & Somers, 2014; Dale, 2016; Fraser, 2017). For these and other reasons, the search for a complete, discrete, and unified Polanyian method seems destined to remain a frustrated one. Considerably more generative, however, has been the practice of reading Polanyi *alongside others*, and in the spirit of and/also conversations rather than either/or debates. It is in this spirit, that of a supplement rather than a replacement, that we proceed here, proposing to complement the post-Polanyian framing proposed by Grabher and König, with which we broadly sympathize, with a parallel reading that takes its cues from the work of another heterodox and somewhat idiosyncratic theorist, Fernand Braudel.

Not unlike Polanyi, Braudel combined original and capacious thinking with a rather undisciplined writing style and sometimes inconsistent formulations, marrying encyclopedic inquiries with a reluctance to totalize or systematize. Neither Polanyi nor Braudel had any time for stage models, teleology, and economism, both instead practicing "exchangist" modes of analysis and tending to favor rhetorical exegesis, indexed to concrete historical situations, over rigorous abstraction or theoretical dogma. Crucially, both Polanyi and Braudel understood the economy to be a house of many rooms, but if the Polanyian triptych (market exchange, reciprocity, redistribution) presents as a horizontal one, Braudel's is more hierarchical (material life, market economy, capitalism). For Braudel, the material economy of everyday life represents a base of sorts ("the soil into which capitalism thrusts its roots but which it can never really penetrate"), over which is layered the more familiar and indeed

"favored terrain of the market economy," but atop of *all of* which stands, at the apex of this pyramidal conception, the shadowy "zone of the anti-market [...] the *real home* of capitalism" (Braudel, 1982, pp. 229–230, emphasis added). This hierarchical conception is joined with a subtle sense of the dynamic "social geographies" of the globalizing economy, which Braudel understands to be "neither homogenous or straightforward" (Germain, 1996, p. 205), comprising a mutating plurality of "world-economies" (*Weltwirtschaft*). In dialogue with these vivid formulations, the present paper considers how the platform moment, rather than representing some revolutionary break, reflects and refracts *rhythmic* currents in the historical geography of (monopolizing) capitalism. Taking cues from Braudel, we argue that the real home of platform *capitalism* is the zone of the antimarket, a murky but dominating layer located above the competition, where it operates as a new machine with an old purpose: that of controlling markets from above and, in the process, generating significant concentrations of political-economic power.

Since our goal here is to supplement rather than supplant the productive array of political-economic treatments of platform capitalism (see, for example, Kenney & Zysman, 2016; Langley & Leyshon, 2017; Srnicek, 2017a; Montalban et al., 2019), we set out to explore the distinctive potential of a Braudelian approach, which can be read as both affirming and adding to these extant treatments. We offer this Braudelian perspective not as partisans of longue-durée historical analysis, but on the grounds that it brings something distinctive to what should remain a heterodox, plural, and open conversation. Asking the platform question in the company Braudel is to *begin with* problematics of monopoly power and antimarket behavior, rather than with technological affordances, network capacities, or (distortions of) the market. It is categorically not to say, we emphasize, that the platform phenomenon can simply be retrofitted into some standard-issue model of capitalism, understood as a universal and unchanging system, less still that Amazon and Facebook are but new iterations of the Dutch trading houses Sixteenth Century. It is, instead, to take inspiration, and a series of conceptual cues, from the Braudelian system of thought. Braudel's approach to capitalism is certainly expansive, but great store was also set by attending to its shape-shifting mutations over time and across space. To the extent that capitalism exhibits a "certain unity," he argues, this is realized through a constellation of recurrent tendencies grounded in "its unlimited flexibility, its capacity for change and *adaptation*" (Braudel, 1982, p. 433, original emphasis). "The worst error of all," he reflects, "is to suppose that capitalism is simply an 'economic system,' whereas in fact it *lives off* the social order, standing almost on a footing with the state, whether as adversary or accomplice" (Braudel, 1984, p. 623, emphasis added). To think about platforms along with Braudel, then, is to problematize both their conjunctural specificity and their positions on the moving terrain of an always-mutating capitalism.

Engaging especially with the striking image of the antimarket, the home of the big beasts of capitalism, "where the great predators roam and the law of the jungle operates" (Braudel, 1982, p. 230), we set out in this paper to develop a Braudel-inspired sketch of the platform conjuncture, drawing on three conceptual devices borrowed from the historian's analytical repertoire. The following section begins with the antimarket, the *contre-marché*, confronting the decidedly anticompetitive culture of the platform economy, with its new modalities of monopoly rule. The second part of the paper takes as its point of departure Braudel's image of *zones d'opacité* — his portrayal of capitalism as a dimly-lit overworld — exploring how pervasive discourses of technological futurism, novelty, incommensurability, and endogenous, self-propelling dynamics continue to obscure the ways in which platform modes of (corporate) organization are coproduced with (and coexist dynamically with) entrenched features of contemporary cap-

italist development, including deep financialization and dysfunctional regulation. Then, in the third section of the paper, we turn to the emergent spatialities of platform capitalism as a variegated and conjunctural form(ation), insinuated as it is into everyday life and various (de)regulatory settlements, while at the same time residing in the ethereal space of the "cloud." Here, Braudel's novel conception of "world-economies" — as the coexisting fragments of an emergent globality, each with their own power centers and patterns of concentrated control — once again prompts some searching questions. The paper is concluded with some comments on the nature of platform power.

2 Where the Great Predators Roam

Immanuel Wallerstein once wrote that Braudel "viewed capitalism in a way that, in the eyes of most of his colleagues, could only be termed seeing it 'upside down' " (1991, p. 354). The Braudelian schema upends dominant understandings of capitalism in two ways. First, in contrast to conventional expectations of a prevailing trend towards competitive markets, Braudel holds that the recurrent tendencies in capitalism are for concentration and monopolization, culminating in his contrarian formulation of the antimarket. Second, against the presumption that capitalist development entails ever-more intricate divisions of labor, he maintains that capitalists are characteristically averse not just to competition but also to specialization, while displaying promiscuous appetites for "avaricious speculation." His rendering of the antimarket as the "real home of capitalism" is not just different to the orthodox tale of the market economy, with its self-regulating laws of competition, it (co)exists in a parasitic fashion with this "sunlit world" of appearances, relying upon but at the same time looming menacingly above the "transparent" domain of market exchange and the economies of everyday life as well. Apprehended as a world "out of the ordinary," the capitalist antimarket is "a shadowy zone, a twilight area of activities [that is nevertheless positioned] at the very root of what is encompassed by the term capitalism" (Braudel, 1982, pp. 405, 22). The real home of capitalism, then, is not an extension of markets and market rationality, not even a *distortion* of competitive logics. For Braudel, it is more like an inversion, an overworld of concentrated power and superprofits, located on the other side of an opaque mirror; *la zone du contre-marché* is where the big beasts roam, their powers largely unchecked. This is an "anti-market in the sense that it can only exist and prosper through continual disruption from a distance of the circular flow of economic life" (Arrighi, 2001, p. 121).

Braudel's graphic portrayal of capitalism does not imply singularity in form or indeed unilateral dominance. Capitalism is understood as a "predatory" system, *living off* the layers of economic life below, but also a polymorphic one: the "plurality of capitalism [goes] back a long way" (Braudel, 1984, p. 604). The uneven and episodic effects of finance capitalism figure prominently in this historically constructed understanding, but Braudel's longue-durée reading of the transformations of capitalist power is particularly concerned with the activities of the trading classes, and with the interrelationships between merchant capital, market economies, and states. Historically, the merchant-capitalists, notably those that came to dominate long-distance trade by stitching together smaller and localized markets in search of the highest rates of return, derived their uniquely profitable positions from "the *concentrations* [that these arrangements] made possible," generating in the process "an unrivalled machine for the rapid reproduction and increase of capital" (Braudel, 1982, p. 408, original emphasis). These traders (*les négociants*) were in the business of intermediation, but hardly mere go-betweens. They were aggregators, positioned above the fray:

> The great "merchants" of the past never specialized: they went in indiscriminately, simultaneously or successively, for trade, banking, finance, speculation on the Stock Exchange, "industrial" production, whether under the putting-out system or more rarely in manufactories (Braudel, 1984, p. 621).

The merchant capitalists reaped "the fruit of monopoly," in Maurice Dobb's terms, by way of extractive and predatory actions articulated with the market sphere (an arena of "small profits," for Braudel), but once removed from quotidian worlds of the everyday economy: "the remarkable gains of merchant capital in the fourteenth and fifteenth centuries [...] were acquired by an exclusion of the mass of the producers from sharing in the benefits of an expanded volume of trade rather than by any actual depression of the general standard of life" (Dobb, 1950, p. 119). Banaji (2020, pp. 120–121) likewise observes that, over the centuries, "there [has been] practically no sector or type of investment that [merchants] did not invade, exploit, or monopolize."

The remarkable ascendancy of the platform monopolies in recent decades has also been predicated on the exploitation of positions that bear little resemblance to those of ordinary market participants down below. While it has been common for platform operators to style themselves as enablers and intermediaries, the most successful have gone on to amass powers, capacities, and privileges commensurate with a jurisdiction-spanning, *infrastructural* presence in the economies of market exchange and everyday life (see Bratton, 2016; Kornberger et al., 2017; Plantin et al., 2018; Clarke, 2019). As Rahman and Thelen (2019, p. 180) observe, "the very idea of the 'platform' reflects an aspiration to be the foundational infrastructure of a sector — whether it is Uber's attempt to dominate transportation services from taxis to shipping or Amazon's dominance of the online retail market as a whole." As platforms have engaged in the insinuative practices of "infrastructuralization," they have reshaped not just the terms of trade but the very terrains on which it is practiced. More than this, as some platforms have morphed into low-cost, widely accessible systems, they have come to fulfill "basic" societal functions (Larkin, 2013), relied upon and even "loved" by their customers (Khan, 2017; Zuboff, 2019).[1]

Platform operators "are not generally buyers and sellers of goods themselves, as in a traditional production market [but instead] produce networked 'marketplace platforms' which in turn provide opportunities to buy and sell — skimming a percentage of each transaction as a middleman" (Castelle, 2016, p. 14). Since platforms are also positioned so as to exploit market intelligence derived from these transactional spaces (a resource now conventionally described as big data), within which they establish, maintain, and police rules of participation, their multifaceted roles clearly amount to "considerably more than just intermediation" (Christophers, 2020, p. 190). Thousands of third-party (or "complementor") firms now conduct their business *on* platforms, and according to the rules of those platforms, doing so in the context of constrained agency and asymmetrical power relations. While some have portrayed this as a new mode of competitive cooperation or "coopetition" (Ritala et al., 2014), third-party firms that do their business on platforms are routinely subject to the risk of being picked off, absorbed, or consumed by the platforms themselves, while it is common for transactional rules and even prices to be effectively dictated by the platform operators too. It has been said that complementor firms are, by definition, "dancing with wolves" (Lan et al., 2019).

Rather than simply entering conventional markets, platforms "remake (and rematerialize) them" (Cohen, 2019, p. 133), engendering transformative effects that exceed the meaning of

1. This calls to mind one of Joan Robinson's (1962, p. 130) famous aphorisms, that might be modified for these digitally mediated times: platform capitalism may be "cruel, unjust, turbulent, but it does deliver the goods, and, damn it all, it's the goods that you want."

the commonly used term "disruption." As Zysman and Kenney (2018) have argued, platforms effectively function as "regulatory structures," enabling and dictating the terms of the interactions they facilitate, and shaping the behavior of users in a fashion "geared toward the systemic collection, algorithmic processing, circulation, and monetization of user data" (van Dijck et al., 2018, p. 4). This capacity to extract and capitalize on the new "resource" of big data, a defining feature of platform capitalism, enables its corporate giants to position themselves above the market economy's ordinary fray. As the United Nations Conference on Trade and Development report *Power, Platforms and the Free Trade Delusion* explains:

> Using a combination of strengthened property rights, first-mover advantages, market power and other uncompetitive practices [...] platforms control and use digitized data to organize and mediate transactions between the various actors, and have the capability of expanding the size of such ecosystems in a circular, feedback-driven process (UNCTAD, 2018, p. vi).

In other words, the intelligence that platforms routinely collect on users — referring to personal characteristics, transaction histories, behavioral patterns, attitudes, and orientations — is the fuel for those "network effects," or demand-side economies of scale, that are said to animate the "new economics" of the platform era (Gawer, 2014, p. 1240). Platforms "become more valuable to each user as more people use them," which in turn attracts more users, after which lock-in effects heavily favor incumbents (McAfee & Brynjolfsson, 2017, p. 140; Parker et al., 2016; Cusumano et al., 2019). These network effects subsequently propel a "virtuous feedback loop that produces monopolies" (Parker et al., 2016, p. 6), most mature platform markets being ultimately dominated by "one or two giants" (Lynch, 2017, p. 802).

Management gurus and even critical commentators are wont to ascribe network effects with almost magical properties, stressing their boundless capacities for generating growth, deepening market dominance, and (eventually) turning a profit. In an early projection of the platform imaginary, venture capitalist Marc Andreessen (2011, p. C2) declared that "software is eating the world," as part of a "dramatic and broad technological shift in which software companies are poised to take over large swaths of the economy." Today, platform evangelists offer a small but significant amendment to Andreessen's claim, contending that it is not software *per se* that is eating the world, but a new and effectively contagious business model. What Sangeet Paul Choudary (2015, p. 15) conceives as platform *scale* is "powered by the ability to leverage and orchestrate a global connected system of producers and consumers toward efficient value creation and exchange," a new corporate model that has been rippling across sector after sector of the (globalizing) economy. It is argued that, in contrast to the vertically integrated corporations of the Fordist era, platform operators tend to capture and consolidate markets in a more horizontal fashion, capitalizing on what Srnicek (2017b, p. 256) describes as a "rhizomatic form of integration." Neither hierarchy nor market, the platform mode of organization deviates from the (classic) network form too, combining as it does distributed regimes of control (which some have dubbed "putting out 2.0") with the centralization of power (see Kornberger et al., 2017; Watkins & Stark, 2018). Such are their capacities to co-opt, to cross-subsidize, to loss lead, to monitor and police, and to leverage new modalities of commerce, platforms are able to surround and swallow competitors and even entire markets. And yet these predatory practices are "often hidden from view" (Rahman & Thelen, 2019, p. 180), including under the benign cloak of network economics and horizontalist metaphors.

There appears to be no stopping the platform wave. The MIT Initiative on the Digital Economy proclaims that "everywhere there *can* be a platform, there *will* be a platform" (MI-

TIDE, 2018, emphasis added), while somewhat more soberly Peter Evans and Annabel Gawer observe that "platform ecosystems"

> are gaining ground through the digitalization of products, services and business processes and in the process are reshaping the global landscape [...] online platforms have upended numerous brick and mortar chains and are making deep inroads into other industries from television to transportation. Although it is still early days, they have the potential to be equally disruptive to traditional approaches to banking, healthcare and energy services (Evans & Gawer, 2016, p. 4).

As Kenney et al. (2019, p. 877) astutely remark, however, ecosystem metaphors of this kind serve an ideological purpose in that they work both to misrepresent and to conceal "power dynamics that more closely resemble those for serfs on a feudal manor — always at the mercy of the lord who can expropriate their business without any compensation."

The explosive growth and colonizing effects of platform capitalism have been likened (even by its advocates) to land grabs, in which first-movers race to secure new territories and to build scale through the exploitation of so-called network effects, subsequently to erect daunting barriers to entry. Sometimes starting off in specialist or newly created niches (as in Amazon's initial foray into bookselling, or Uber's original focus on ride-hailing), the engine of platform economics is this relentless drive to scale, often juiced by significant injections of venture capital, generating secular trends towards diversification, consolidation, and hybridization, as dominant platforms leverage (market) power in one sector to override competition in others (Evans & Gawer, 2016; Cusumano et al., 2020). Writing in the *Sloan Management Review*, Michael Cusumano and colleagues predict that as the platform sector continues to proliferate laterally, across markets, the cumulative outcome will be deepening corporate concentration, such that "even more market power [is] concentrated in a smaller number of large platform companies" (Cusumano et al., 2020, p. 50). Furthermore, the platform giants can be expected to develop increasingly tangled and symbiotic relations with states, (would be) regulatory agencies, and political elites — echoing the recurrent fusions of capitalist and state-political power described by Braudel.

Already, the largest platforms "exercise a level of market dominance that inspires comparison to classic monopolies of the nineteenth and twentieth centuries" (Rahman & Thelen, 2019, p. 178), albeit with a new twist. This new manifestation of monopoly power is neither acquired nor maintained through traditional forms of direct ownership — as in the monopolies of the Gilded Age — but has instead accrued through distinctive, digitally-enabled capacities to *control* and *manipulate* markets, including in a host of more distantiated and mediated ways. In the words of digital futurist, Tom Goodwin:

> Uber, the world's largest taxi company, owns no vehicles. Facebook, the world's most popular media owner, creates no content. Alibaba, the most valuable retailer, has no inventory. And Airbnb, the world's largest accommodation provider, owns no real estate. Something interesting is happening. Since the Industrial Revolution, the world has developed complex supply chains, from designers to manufacturers, from distributors to importers, wholesalers and retailers, it's what allowed billions of products to be made, shipped, bought and enjoyed in all corners of the world. In recent times the power of the Internet, especially the mobile phone, has unleashed a movement that's rapidly destroying these layers and moving power

> to new places [...] The new breed of companies [is] the fastest-growing in history. [They occupy] *indescribably thin layers that sit on top of vast supply systems (where the costs are) and interface with a huge number of people (where the money is)* [...] The interface layer is where all the value and profit is (2015, p. 1, emphasis added).

What the platform operators *do* own, of course, is the platform itself, over which they "have a great deal of discretion" (McAfee & Brynjolfsson, 2017, p. 165).

We are unambiguously in the precincts, it would seem, of the "real home of capitalism," in which an overclass of traders and financiers "inserts itself into the chain leading from production to wholesale trade, *not seeking to take over entire responsibility for them, but to occupy the strategic points controlling the key sectors of accumulation*" (Braudel, 1984, p. 65, emphasis added). For Braudel, capitalists are defined not by their direct ownership of the means of production (as in the conventional Marxist sense), or their supply of financial resources (as neoclassical models have it), but instead by their privileged positioning, and behavior, as an elite (over)class with the power "to manipulate the market economy and create conditions of unequal exchange" (Bakker, 2007, p. 543). In the Braudelian account, the true capitalists are a breed apart; they are the big beasts operating at the very top of the food chain, "where the law of the jungle operates," like apex predators roaming above (and preying upon) small-time traders and ordinary market participants below. As Samuel Kinser says of this Braudelian conception, the "big speculators [are] another animal entirely," their privileged preserve being

> [t]he capitalist's proper sphere [...] the international world of long-distance trade and banking, the sphere of historical grandeur and of grand profits where kingdoms and fortunes are made and unmade, by virtue of the ability of the capitalist to cross frontiers and to profit from regional and national differentials in supply and demand (1981b, p. 674).

Masters of arbitrage and makers of monopolies, these arch-capitalists have long been renowned for their "power, cunning, and intelligence" (Braudel, 1982, p. 418).

One does not have to look far to see Big Tech portrayed in similar terms. In *Surveillance Capitalism,* for example, Zuboff (2019, p. 9) castigates the platform giants for staging "an unprecedented market operation into the unmapped spaces of the internet, where [they have] faced few impediments from law or competitors, like an invasive species in a landscape free of natural predators." Similarly, Maya McGuineas — president of the Committee for a Responsible Federal Budget, a Washington-based think tank closely allied to the primary circuits of financial and political power in the United States — warns that Big Tech's "addiction economy" represents a mortal threat to the free-market capitalism that her organization seeks to defend:

> [T]he new powers in the digital age have built their business models on strategies—enabled and turbo-charged by self-improving algorithms — that actively undermine the principles that make capitalism a good deal for most people. Their aim is not merely to gain and retain customers, but to create a dependency on their products [...] The capitalism that is taking shape in this century — predatory, manipulative, extremely effective at short-circuiting our rationality — is a different beast from the classical version taught in university classrooms. It cannot be regarded as beneficent and should not be given the benefit of the doubt. Profit motive and the means to create dependency is too dangerous a combination (MacGuineas, 2020, p. 12).

Big Tech has indeed been a pioneer of a "predatory, manipulative" style of capitalism, and there is no question that it is a "different beast" to the entrepreneurial firm of the (neo)classical imagination. In the 1990s, for example, Microsoft gained some notoriety for its "embrace, extend, and extinguish" (EEE) strategy, a corporate ruse intended to deter startups and other competitors from the company's theater of operations. In 2001, *United States v. Microsoft* recommended the breakup of the corporation, charging the company with abusing its market position in the so-called "browser wars," leading to the creation of a "kill zone" for would-be competitors. The ruling against Microsoft was overturned on appeal, but the findings of fact in the case were not.

For industry insiders like Albert Wenger, an early investor at Twitter, "[t]he kill zone is a real thing," representing a powerful deterrent not only to would-be competitors but also to innovation, since the evidence suggests that the rewards in winner-take-all markets now systematically favor capital and scale, rather than innovation *per se* (Schechter, 2018; Kamepalli et al., 2020).[2] The existence of kill zones — predatory spaces located around (or "under") the reserves of the platform giants — has become a socioeconomic fact of life. In fields like enterprise software and online retail in particular, platforms have practically *become* the market, such that successful third-party firms can be monitored, stalked, and picked off at will (Economist, 2018). According to Margarethe Vestager, executive vice president at the European Commission, the pivotal question has become "whether or not these markets will be open and contestable and innovative, or if they will just be governed by these walled gardens of de facto monopolies" (quoted in Satariano, 2020, p. A1). Zuboff maintains that an appropriate response to the problem of tech companies gone "rogue" is the restoration (or establishment) of a more competitive market order, supplemented by consumer protections (see Morozov, 2019). But the implication seems to be that anticompetitive and predatory behavior is somehow aberrant. On the contrary, "many platforms *by their very nature* prove to be winner-take-all markets" (Kenney & Zysman, 2016, p. 3, emphasis added; Parker et al., 2016; Lynch, 2017). Or as Christophers (2020, p. 206) succinctly puts it, "monopolization is a feature, not a bug." The antimarket does indeed seem to be the true home of platform capitalism.

3 *Zones d'Opacité*

For Braudel, the home of capitalism was a hidden abode of sorts, an occluded realm of hegemonically embedded power relations scarcely "discernible to the naked eye," the favored subjects of which practiced a "sophisticated art open only to a few initiates at most" (Braudel, 1982, p. 455; 1981, pp. 23–24). Capitalism is seen as a "world of privilege and monopoly" (Day, 1980, p. 510), in which socioeconomic elites "are engaged in circuits and calculations that ordinary people [know] nothing of," such as foreign exchange, long-distance trade, and exotic credit arrangements (Braudel, 1981, p. 24). The operations of platform firms — with their algorithmic manipulations, expert workforces, and unprecedented surveillance capacities — are by no means out of place on such a list. In fact, as Shira Ovide remarks, "tech companies [have been constructed] around software that is designed *not* to be understood by outsiders."

> Few people on the outside can truly understand how Amazon influences the prices of products we buy on its site or at other retailers; assess fears that Google funnels people to its own websites or that Apple steers people to its own apps; or peer into

2. Note that today, capital, scale, and therefore monopoly power are commonly (mis)represented as "innovation" in the technology-saturated discourse that surrounds Big Tech and the platform phenomenon.

> Facebook's strategy to squash rivals in their cribs. *All of this is, by design, shrouded in secrecy and mystery* (Ovide, 2020, pp. 1–2, emphasis added).

Even though this is a world that Braudel never got to see, and could scarcely have conceived, its pervasive culture of secrecy and obfuscation would have come as no surprise. As Wallerstein (1991, p. 355) observes, Braudel held that the stratospheric layer that was capitalism's true home was opaque "because the capitalists wanted it so," complete (market) transparency being "unthinkable." In contrast to the sunlit world of the market, "*real* capitalists," with their power plays, predatory behaviors, and monopolistic practices, are creatures of the shadows. The platform corporations — with their ubiquitous presence in everyday life and pervasive reach across highest reaches of culture and politics — may be hidden in plain sight, "right in front of our faces" (Wu, 2018, p. 11), yet the dimensions, depth, and full implications of their powers remain largely beyond grasp, if not view, not least for those with an interest in curtailing, regulating, or countering those powers. Again, this is a form of "dominance [...] *hidden from view*" (Rahman & Thelen, 2019, p. 180, emphasis added). Tim Wu consequently joins those that equate the platform era with the Gilded Age, portraying the powers of the digital moguls as new-age manifestations of "kingly prerogative."

That corporations occupying monopoly positions, and operating at the fringes of regulation, should have an interest in discretion, if not secrecy, is hardly unfathomable, and neither of course is it limited to the platform giants. While cultures of detachment and secrecy are, as Braudel emphasizes, as old as capitalism itself, these cultures exhibit a particular form in the platform era. The masters of the digital universe have been especially scrupulous, indeed effective, in their defenses of the principle (and space) of self-regulation, being shielded not only by well-resourced lobbying operations, but also by thick curtains of technological determinism and futurism, sustained by (new) cultural circuits of capitalism (see Thrift, 2005).

One of the things that digital capitalism is particularly good at, Evgeny Morozov (2019, p. 2) observes, is "cover[ing] its tracks," the giants of the technology sector having "developed a panoply of rhetorical and political tricks that insulate them from any pressure from below." The imaginary of the platform itself plays a role here, suggesting the provision of support (from below), like a Twenty-First Century utility service, and calling to mind a level playing field for "open, neutral, egalitarian" exchange (Gillespie, 2010, p. 352). Indeed, the word platform connotes "something singularly anodyne and innocuous: an operator providing a forum for others [...] while itself remaining outside the fray" (Christophers, 2020, p. 191). Meanwhile, the matrix-like capacities of platforms mean that they can appear to be everywhere but at the same time remain curiously placeless — their preferred address, appropriately enough, being "the cloud." At least prior to the "techlash" of recent years (see Atkinson et al., 2019), platform moguls were frequently lionized as entrepreneurial mavericks, as the fearless shapers of new paradigms, and as the seers (and makers) of alternative worlds. Pervasive cultures of technophilia sustain these performative mystifications, the dominant discourses of which variously obfuscate and misdirect from the black-boxed interior operations of the digital corporations, which are concealed behind proprietary software systems, functionally illegible (and practically uncontestable) user agreements, and vast arsenals of legal and lobbying firepower.

Hallmarks of platform discourse, like epochal rhetoric, narratives of digitally-enabled novelty, and celebrations of new-found economic capabilities, also function to detract attention from underlying continuities and constitutive contexts. A relevant point of reference, yet one that is frequently overlooked, is the "new economy" moment of the late 1990s, a time of irrational exuberance when romanticized notions of recession-proof economic expansion were purposefully circulated, as "heroic adventure[s] in innovation" (Feng et al., 2001, p. 468; Frank,

2000; Cassidy, 2003), through an increasingly integrated financial, business, and technological media complex. For Thrift (2005, p. 124), "the new economy story worked, and worked to the extent that it began to re-describe market fundamentals," including new registers of valuation yoked to enabling narratives of enigmatic novelty, incommensurability, and unprecedented growth potential, which inflated an historically large stock-market bubble, while deflecting arguments for regulatory intervention, on the grounds that it would kill the golden goose. Also symbolically anchored in the technology-finance nexus of the United States, the new-economy moment combined deregulationist fervor, ideological hubris, and corporate narcissism with a radical ahistoricism. But soon it was over (at least in this pre-conjunctural form). As Karel Williams (2001, p. 41) remarked at the time of the new-economy crash, it would be a mistake to bracket the preceding period off as some aberrant "episode of limited significance which can now be left to the historians of the internet," this was also "business as usual, acting out changes and continuities which are part of our future as much as our past and which have as much to do with finance and politics as with technology."

If the new-economy moment can be seen, in retrospect, as a prelude to the platform conjuncture, the latter arguably represents something beyond mere continuity, instead marking processes of extension, intensification, and normalization (see Montalban et al., 2019). As Rahman and Thelen have argued, "rather than displace previous corporate forms, platform firms actually often embrace and extend features of those models," effectively *recombining* lean, networked, and financialized modes of organization in conjunction with an augmented bundle of capacities, affordances, and orientations:

> Platform firms such as Uber and Amazon were facilitated by previous developments such as the emphasis on shareholder value, financialization, and labor-shedding. But they combine these elements with new features to produce a distinct model of the firm that poses even more extreme challenges to the social contract [...] The shift to the platform firm [...] was enabled by technologies that lowered the cost of monitoring outsourced or franchised operations. Technology thus allowed lead firms to get the "best of both worlds" — slashing labor costs and escaping regulatory oversight while at the same time exercising enormous control throughout their networks of outsourced, franchised, or contract labor, production, and manufacture (2019, pp. 179, 183).

Langley and Leyshon (2017, p. 14) strike a similar balance, portraying the platform model as a "distinct mode of sociotechnical intermediary and business arrangement," actively coproduced with ongoing processes of capitalization, that melds novel features with extant (and extended) capabilities: the platform corporations, having transcended the so-called stage of "market disruption," are now leveraging winner-take-all positions in "digital turf wars."

Contrary to the image of a digitally powered revolution, driven from within, the supply lines for these wars of maneuver and attrition unambiguously run back to the venture-capital industry and the extended apparatus of (U.S. style) financialized capitalism, which has been hooked on (and into) speculative opportunities in the platform sector in ways that do not just rhyme with but practically repeat the dynamics of the new-economy bubble. As Langley and Leyshon point out, U.S. venture-capital funds made nearly $60 billion in investments in 2015, disproportionately targeted on the software sector, the second highest annual total since the birth of the new economy in 1995. Venture capitalists have positioned themselves, once again, as sponsors of innovation-rich development, indeed as "knowledge brokers" working to "fuel the economy of tomorrow" (Zook, 2005; NVCA, 2020). Correspondingly, the platform

business model has been predicated on unprecedented injections of cash, not just favoring but bankrolling strategies of long-run market dominance, most conspicuously in the celebrated "mega-deals" (exceeding $100 million) that are structured so as to capitalize "on the potential of platforms to realise monopoly rents" (Langley & Leyshon, 2017, p. 11; NVCA, 2020).

Figuring out the internal financial structure of this new new-economy has proved to be something of a challenge, not least because "[o]ne of the most remarkable things about the platform-rentier business is that the revenue model is so frequently opaque" (Christophers, 2020, p. 188). Themselves creatures of lax and forgiving regulatory environments (a.k.a. neoliberalism), the big beasts of the platform world have been consolidating monopoly positions in the face of precious few impediments. Proactively occupying that "thin layer on top" (Goodwin, 2015, p. 1), high up in the clouds, they have remained largely beyond the reach of earthbound regulators. Most conspicuously, the framework of antitrust laws, inherited from the last century has proved to be largely toothless:

> [C]urrent law underappreciates the risk of predatory pricing and how integration across distinct business lines may prove anticompetitive. These concerns are heightened in the context of online platforms for two reasons. First, the economics of platform markets incentivize the pursuit of growth over profits, a strategy that investors have rewarded. Under these conditions predatory pricing becomes highly rational — even as existing doctrine treats it as irrational. Second, because online platforms serve as critical intermediaries, [they] control the essential infrastructure on which their rivals depend. This dual role also enables a platform to exploit information collected on companies using its services to undermine them as competitors (Kahn, 2017, p. 803).

That the platform operators remain largely impervious to meaningful regulation is a *produced* condition, and one that is being vigorously defended. The evasiveness and lobbying power of the platform corporations — what Braudel would have called their cunning — have become matters of public record and political concern. Yet as pressures for regulatory reform have been building, in Europe, the United States, Japan, and elsewhere, the defenders of corporate freedom have been mobilizing to run new kinds of interference. For example, Big Tech now has its own think tank, the Global Antitrust Institute (GAI), with an address in one of the suburban capitals of neoliberal policy advocacy and a mission to avert regulatory incursions into the space of the digital economy (see GAI, 2020; Wakabayashi, 2020). Established in 2014 at George Mason University's Antonin Scalia Law School with funding from leading tech companies like Amazon, Google, and Qualcomm, the GAI purports to advocate for "sound economic analysis" by means of legislative lobbying and "educational" efforts, including a program of institutes for judges and "competition enforcers," the reach of which is practically global (GAI, 2019).[3] Protesting rather too frequently that its own position and perspective are "balanced," its motivations merely those competition-friendly contributor to the "marketplace of ideas," the GAI (2020, p. viii) is proving to be a doughty defender of Big Tech's digital turf, contesting what it portrays as the "revolutionary zeal" of regulators, while concealing its vested interests and ideological commitments behind a veneer of scholarly, evidence-based analysis.

3. The programming of the GAI extends far beyond its U.S. base of operations, to Andalusia, Argentina, Australia, Brazil, Canada, Chile, China, Chinese Taipei, Costa Rica, the Dominican Republic, Germany, Honduras, Hong Kong, India, Japan, Luxembourg, Malaysia, Mexico, Mongolia, New Zealand, Pakistan, Peru, the Philippines, Portugal, Singapore, Slovenia, South Korea, Spain, Thailand, Vietnam, and the courts of the European Union.

Like many of the institutions that have been working in the shadows to protect and advance the interests of the platform giants, the GAI is not simply a creature of the platform moment itself, but has deeper roots in the neoliberal political project known as law and economics. Advocating for the application of orthodox economic analysis to legal cases, the law-and-economics movement established one of its beachheads in the Manne Institute for Federal Judges, with its intensive programs of education in antitrust restraint and regulatory rollbacks (Ash et al., 2019). The GIA's training program borrows this model, promulgating a "simplistic vision of markets" in tandem with a disciplined and consistent message that "the best way to foster competition is to maintain a hands-off approach to antitrust law" (Wakabayashi, 2020, p. B1).

4 Worlds of (Platform) Capitalism

Braudel reads global capitalism as a pluralized order, "going back a long way" (1984, p. 604), one shaped by an array of structural logics, organizational principles, cultures, and patterns of wealth creation. He sees capitalism as a "hydra with a hundred heads," the protean powers of which are gathered in and projected from particular places — with world cities serving as geographical anchoring points for prodigious capacities and "vast orientations," extending to the horizon (Braudel, 1982, p. 10; Braudel, quoted in Kinser, 1981b, p. 674). Once again, Braudel is standing on common ground with Polanyi, with his recognition of socioeconomic diversity and coexistence, married with a concern to "place" economies in relation both to their others and to their more-than-economic contexts. Yet whereas Polanyi proceeds by documenting different modes of economic integration and their variously "instituted" forms, Braudel travels a different path, reserving a special place for mapping the rise, fall, and interaction of various "world-economies," tied to the programmatic goal of understanding the dynamic spatialities of historical capitalism (see Helleiner, 1990; Germain, 1996; Harris, 2004). Disinclined to theorize around an allegedly axial moment of history (such as the apogee of industrial capitalism or the great-transformationalist threshold, less still the vantage point of the restructuring present), Braudel seeks to trace rhythms and patterns across an encyclopedic array of conjunctures and configurations, in search not only of recurrent processes and practices, but also inflection points, along with moments of discord, dislocation, and contradiction. The irreducibly complex outcome does not resemble a linear sequencing of stages, but instead sets up "a continuing tension between the forces of monopoly (so-called real capitalism) and the forces of liberation [...] through self-controlled activities within a complex of competitive markets" (Wallerstein, 1991, pp. 360–361). Braudel's (dis)position is that

> critics and observers generally fail to adopt the spatial-temporal horizon needed to grasp the rules of capitalist game and the ever-changing combination of disparate local conditions under which the game is played out (Arrighi, 2001, p. 116).

Extending the spatiotemporal horizons of analysis to the point of commensurability with the globalizing rules of the capitalist game amounts to an undeniably demanding remit, to theorize across conjunctural difference, to situate and to historicize, and to engage with plural and multipolar worlds always in (relational) transformation. This is not a recipe for the refinement of narrowly-drawn ideal types or extrapolation from putatively paradigmatic sites, but for searching inquiries across the "components" (or "fragments") of an evolving and variegated world economy, with an eye to the "continual reshuffling of the components with which the key capitalist players become temporarily and instrumentally identified in their ceaseless pursuit of profit" (Arrighi, 2001, p. 119).

Braudel is careful to specify what he calls "world-economies" (in a particular translation of the term *Weltwirtschaft*), each of which "only concerns a fragment of the world, an economically autonomous section of the planet able to provide for most of its own needs," the internal linkages and exchanges around which endow "a certain organic unity" (Braudel, 1984, p. 22). World-economies each have their own structural logics and organizational principles, indeed their own rhythms of operation (or "world times"); they each exhibit characteristic patterns of practice, culture, and consciousness (*mentalité*), displaying different fusions of capitalist and state power. Revealed in the "vibrating surface" made by international trade and commerce, world-economies function in the fashion of an "arterial system [that] distributes blood throughout a living organism" (Braudel, 1984, p. 83), each projecting what amount to different modalities of strategic monopoly rule (Helleiner, 1990; Webb, 1992). World-economies are each structured around a distinctive spatiality, typically anchored to a dominant city-region (the "logistical heart of its activity"), radiating out through various "lines of force" to "middle zones" and more distant peripheries. Each in their own way, world-economies concentrate economic power in the hands of capitalist elites, "powerful merchants [who] lay down the law, sometimes becoming extraordinarily wealthy," denizens of the world cities, which in turn become control points for the flow of "[n]ews, merchandise, capital, credit, people, instructions, [and] correspondence" (Braudel, 1984, p. 27). In the process, a "relative handful of *hombres de negocios*" emerge as the "high rollers of economic history" (Day, 1980, pp. 514, 512).

Platform capitalism has hardly broken with these longue-durée patterns. The highest of rollers of today's global economy today are the heads of the digital fiefdoms, commanding fortunes variously derived from online trading zones, infrastructures, and marketplaces. Jeff Bezos of Amazon, Jack Ma of Alibaba, Mark Zuckerberg of Facebook, Ma Huateng of Tencent, Bill Gates of Microsoft, Larry Page of Alphabet/Google, and others of this not-quite-so-new breed are redefining the very meaning of wealth, while the products and services of their respective operations now reach (regular) customers and (repeat) users numbering in the billions. Notwithstanding the flat-earth ideology that accompanied the globalization of the digital economy (after Friedman, 2005), its distinctive geographies of concentrated control and pervasive reach also bear a more than passing resemblance to Braudel's world-economies, and their contoured spheres of influence. Yet the task of mapping the power-geometries of platform capitalism is really only just beginning.

In one of the few comprehensive studies of the spatial structure of the platform economy, Evans and Gawer's (2016) survey of 176 of the biggest corporate players reveals a headquarters geography dominated by a handful of world-regional control centers, reaching 22 countries in total, but with intense clustering on the West Coast of the United States. With 64 of the world's leading platform corporations, the United States accounts for fully 73% of the sector's global market capitalization and 63% of sectoral employment. A distant but not insignificant second is China, with 63 lead firms and a 22% market share, with Europe and other parts of Asia accounting for the remaining (relatively modest) balance. These massive concentrations of platform power, control, and wealth can be properly described as historic; their world-facing staging grounds in San Francisco, Seattle, Beijing, Shanghai, and Shenzhen echo the hierarchical geographies of Braudel's world-economies, albeit in digital form.

Braudel maintained that the analysis and theorization of world-economies must attend not only to their "vibrating surfaces," but also to their underlying conditions of existence. He believed that the "only" method capable of shedding light on these "historical monsters" was a variant of conjunctural history, tracing the "combination of movements" underpinning capitalism's restless topography. Characteristically "lumpy," conjunctural histories are however

neither erratic, nor do they tend in a unidirectional fashion towards maturation, equilibrium, or some teleological destination. Instead, these lumpy histories must engage the concrete movements of structural forces, legible as medium-term configurations approximating to the "space of a Kondratieff cycle," or a quasi-régulationist periodicity spanning several decades (Day, 1980, p. 509; Vidal, 2019), each of which is associated with a particular patterning (and culture) of powerful interests and spatial forms (Helleiner, 1990). "Braudel's conjuncturalism," Kinser (1981a, p. 94) remarks, characteristically yields a "tangle of distinctions even as it aims to disentangle," but functions at its best when specifying "movement toward or away from a change in pattern," particularly in relation to the interacting evolution of world-economies.

Suggestive though this conception is, a comprehensive mapping of the world-economies of platform capitalism is beyond the scope of the present paper, which must instead suffice with some brief pointers in this Braudelian direction. In this context, folk accounts provide one place to start. According to insiders like Marc Andreessen (2011, p. C2), it is "not an accident that many of the biggest recent technology companies are American," a position of dominance that he puts down to "[o]ur combination of great research universities, a pro-risk business culture, deep pools of innovation-seeking equity capital and reliable business and contract law [that] is unparalleled in the world." The United States has certainly benefitted from first-mover advantages in digital innovation and software development, coupled with especially deep consumer markets. But Andreessen's reading skirts around an array of more structural factors behind the preeminent position of the United States in the platform world. Situating the U.S. in comparative perspective, Rahman and Thelen (2019) identify a series of enabling conditions associated with this weakly regulated and pro-corporate variety of capitalism: a fragmented policy landscape ill-matched to the extra-regulatory entrepreneurship of the platform companies; a deeply financialized political economy flush with excess supplies of venture capital; a legal regime conducive to the formation of consumer-investor coalitions, shaped by a tradition of neoliberal antitrust law that prioritizes consumer welfare (and low prices) over assessments of market dominance; and a constellation of political forces promoting and legitimizing the interests of platform corporations in the absence of countervailing pressures from organized labor or competing fractions of capital (Rahman & Thelen, 2019, pp. 181, 193, 197). This distinctively American configuration sustains what some observers portray as a quintessentially "neoliberal narrative of platform competition," which "lionizes currently dominant firms, looks with suspicion on virtually all regulation of them, and gives current consumer interests far more weight than those of other stakeholders" (Pasquale, 2016, p. 317).[4]

The shape, evolution, and global footprint of platform capitalism cannot be dissociated from these geographical origins, even as the phenomenon is not reducible to the global diffusion of a Silicon Valley-style model. Outside the United States, platform operators encounter, adapt to, and interact with quite different regulatory and political worlds, with constitutive consequences for the actually-existing form of these digitized world-economies. Operating in the context of a balkanized internet, for example, the Chinese model of platform (state) capitalism displays a measure of relative autonomy, following a distinctive path of development, while at the same time exhibiting parallel patterns of concentrated monopoly rule and vast spatial reach. Jia et al. (2018, p. 190) remark that "the Chinese market has spawned an entirely separate ecosystem of platforms and firms, a number of which have grown in size sufficiently to rival the US platform giants." The two largest platform operators in China, Alibaba and Tencent, rank alongside the Big Four tech companies from the United States among the ten

4. The cultural politics of the so-called techlash, coupled with an increasingly restive regulatory climate, may have disrupted the dynamics of this situation, although at this point the outcomes remain difficult to predict.

most valuable companies in the world, yet of course they operate in a quite different milieu of state-capital relations. While Chinese platform operators lack the global reach of their American counterparts, their near-exclusive access to a domestic market of nearly 900 million internet users has sustained analogous processes of scale-driven network effects, including an "infrastructural" presence in the markets for retail goods (Alibaba), services (Meituan-Dianping), credit (Huabei), media (Tencent), and information (Baidu). These and other operators have been expanding into a range neighboring Asian markets.[5]

Braudel cautions against reading the monopoly powers of capitalists as if they are independently and unilaterally secured, insisting instead that they are deeply imbricated with those of capitalist states, sometimes acting as the enablers or guarantors of extra-competitive positions, elsewhere policing the rules of competition by "contain[ing] the forces of the anti-market" (Wallerstein, 1991, p. 457). Ultimately, "[c]apitalism only triumphs," Braudel (1977, p. 64) avers, "when it becomes identified with the state," its privileged position "guaranteed by, incarnated in, the hegemonic power" (Wallerstein, 1991, p. 357). Platform operators in the United States have thrived in a context of a permissive and partly incapacitated antitrust regime, institutional fragmentation, and an entrenched culture of lax regulation. On the other hand, it has been with recourse to its own variety of strategic discretion that China's party-state has "given tech firms such as Alibaba and Tencent just enough space to grow into giants" (Economist, 2020, p. 9; cf. Zheng & Huang, 2018). The Chinese platform operators have benefited from what Zheng and Huang (2018) portray as a "state sponsorship" system, including preferential status in strategic policy projects like the "Internet Plus" strategy, introduced in 2015 with the goal of "creat[ing] a new engine for economic growth" via the expansion of home-grown tech companies. Under this arrangement, support is provided for the internationalization of leading tech firms; party-state actors side with platform operators in labor disputes with gig-economy workers; the internet market is aggressively protected from foreign entrants; and substantial sources of capital are advanced to platform startups.

Yet alongside these points of difference, there are also certain resonances across the Chinese and American cases, mainly in relation to the regulation of platform competition. Chinese competition law is weakly institutionalized and inconsistently enforced, such that there have been few, if any, impediments to the merger and acquisition strategies of leading tech firms, while the tendential monopolization of the massive market for electronic payments has attracted hardly any attention from antitrust regulators (see Jia & Kenney, 2016; Coe & Yang, 2020). The outcomes of this approach are not dramatically dissimilar to those described in the U.S., where since the 1970s antitrust doctrines have been revised in accordance with Chicago-style price theory, diluting the concept of entry barriers and equating consumer welfare with corporate efficiency (Khan, 2017; Wu, 2018; Cohen, 2019). There is a sharper distinction, however, with the competition laws of the European Union, where a succession of antitrust investigations have been launched against Google in the past decade, and cases are being built against Amazon and Apple (Michaels & Schechner, 2020; see also Kang et al., 2020). Beyond this, the European policy landscape is less exposed to the kinds of regulatory evasion and arbitrage on which American platforms have thrived (see Rahman & Thelen, 2019).[6] Table 1

5. The rapacious activities of Chinese platform firms in India, for example, have included the purchase of equity stakes in a number of local startups and significant penetration of Chinese apps — opening gambits in what has been styled as a "tech Cold War," waged across the subcontinent between the U.S. giants and their Chinese counterparts (Ruehl et al., 2020).

6. It may be no coincidence that Europe has been a less accommodating home for platform enterprises, fewer than 30 of the top 200 being headquartered in the region. Most of these are concentrated in the United

provides a schematic overview of some of the major points of regulatory difference between the United States, China, and the European Union, reflecting a discontinuous pattern of interactions between states, institutional and legal orders, and the unevenly developing modalities of the platform model. In light of the distinctive transnational footprints displayed by each of the major platform operators, coupled with the complex interdependencies between different markets and regulatory regimes, this table should not be read as some approximation of free-standing "varieties" of platform capitalism, more as an input to the task of mapping its variegated zones of expansion-*cum*-transformation.

Paralleling these evolving (regulatory) geographies of platform capitalism, there are also segmentations, organizational concentrations, and functional divisions that appear to be more its own making. As powerful shapers of their own world-economies, platforms occupy, transform and rematerialize their markets and operating environments in different ways. They host, facilitate, mediate, and govern a wide array of interactions; they work with a diverse repertoire of revenue models and functional architectures; and they variously remake technical and social divisions of labor according to their specific requirements. Although most of the major platform operators may be engaged, in some fashion or another, in "restructuring the space of capitalist accumulation" (Kenney & Zysman, 2020, p. 55), both the form and the consequences of these restructuring processes vary in complex conjunction with the regulatory and corporate geographies of this (emergent) conjunctural formation.

Would-be cartographers of the world(s) of platform capitalism, however, are hardly facing conditions of unprincipled and unpatterned complexity, since there has been valuable work on different ways to systematically engage and organize its attendant contours and variegations. For example, Brett Christophers' suggestive schema separates out four modes of intermediation: *labor platforms*, through which human labor power is bought and sold; *capital platforms*, which facilitate the sale or letting of capital assets, such as real estate; *commodity platforms*, through which commodities, goods, and services are traded; and *attention platforms*, which seek to monetize and revalue the attention of their users (Christophers, 2020, p. 188). This typology usefully positions platforms on something akin to a Braudelian plane, foregrounding their role as *capitalist* intermediaries variously insinuated into the transactions, networks, chains, and relations that connect laborers with employers, sellers with buyers, producers with consumers, and so on.[7]

Kingdom, where the regulatory order is more closely aligned with that of the United States, such that platforms have enjoyed "free reign to create new markets and disintermediate existing ones" (Christophers, 2020, p. 200).

7. Parallel approaches to classification emphasize revenue and profitability (see Srnicek, 2017a), different types of activities, such as transactions, innovation, investment, or some combination of these (see Evans & Gawer, 2016; Kenney & Zysman, 2016), or distinctions drawn between platforms operating within single firms, across supply-chains, or within industries (see Gawer, 2014).

	United States	China	European Union
Mode of Government	Neoliberal governmentality; non-interventionist approach to economic policy and regulation	State capitalism; interventionist approach to economic policy and regulation	Varied modes of government; tendency toward increased interventionism
Regulatory Capacity	Jurisdictionally fragmented federalist system encourages regulatory entrepreneurship; weak regulatory capacity; holes in labor, financial, and other regulation	Centralized system; strong regulatory capacity; loose and uneven regulatory enforcement	EU rules constrain regulatory entrepreneurship and jurisdictional switching; individual member states have limited degrees of regulatory fragmentation
Antitrust Regime	Consumer welfare-oriented antitrust regime; weak antitrust enforcement in cases of concentrated market control; some special consideration for "new economy" firms	No centralized antitrust regime prior to 2007; current antitrust regime defined by strict merger control to protect domestic companies; limited antitrust enforcement in practice	Market concentration-oriented antitrust regime; enforcement focuses on abuse of market power by dominant firms; no special consideration for "new economy" firms
Data and Privacy Protection Regulations	No federal consumer data or privacy protection laws; no recognized right to be forgotten	Data and privacy protection laws currently being drafted; right to be forgotten denied by Chinese courts	Strong orientation toward consumer data protection (e.g. GDPR); right to be forgotten recognized by the European Court of Justice
Industrial Relations	Weak unionization provides little opposition to platform power; Supreme Court signals lack of support for collective bargaining for platform employees	Party-controlled unionization limits opportunities for collective bargaining; party policies empower platform owners over employees	Nascent unionization signals gathering societal mobilization against platform power; courts divided over collective-bargaining rights for platform workers

Source: authors' formulation

Table 1: Spaces of Platform Capitalism I: Regulatory Geographies

Table 2 takes this schema as a point of departure: Uber is offered as an example of a labor platform; Airbnb and Amazon stand in as proxies for capital and commodity platforms, respectively; and Google exemplifies an attention platform; to which we add a fifth, the *innovation platform*, illustrated by the case of Salesforce.[8] Again, the point here is not to reify a taxonomic categorization, but to illustrate the diversity of the platform economy itself (see also Elder-Vass, 2016; Grabher & König, 2020; Kenney & Zysman, 2020; Vallas & Schor, 2020). These might be thought of as (some of) the coexisting world-economies of platform capitalism, each reaching out from its own "home" territories across an array of markets, infrastructural networks-cum-scales, and transactional spaces. Some, like Amazon for example, are architects of their

8. Evans and Gawer (2016, p. 9) define innovation platforms this way: "a technology, product or service that serves as a foundation on top of which other firms (loosely organized into an innovative ecosystem) develop complementary technologies, products or services."

own (unevenly contested) labor systems, combining a concentrated managerial core with an extensive network of workers and "independent" contractors, while others, such as Airbnb, operate with a tiny cadre of highly-skilled "venture laborers," mobilizing at a distance a vast network of platform participants (see Neff, 2012; Stone, 2013).

	Uber ***Labor platform***	**Amazon** ***Commodity platform***	**Airbnb** ***Capital platform***	**Google** ***Attention platform***	**Salesforce** ***Innovation platform***
Headquarters Location	San Francisco Bay Area, CA	Seattle, WA	San Francisco Bay Area, CA	San Francisco Bay Area, CA	San Francisco Bay Area, CA
Division of Labor	Managerial core + dispersed network of independent contractors	Managerial core + dispersed logistics and distribution labor + independent contractors	Managerial core + non-employee labor (e.g. cleaning and maintenance staff)	Managerial core + independent contractors working alongside the managerial core	Managerial core + distributed network of developers who build on top of the platform
Site of Intervention	Local labor markets	Markets for goods at various scales	Local home rental and hospitality markets	Advertising markets at various scales	Industry technology ecosystem
Scale of Operations	Nearly global	Nearly global	Nearly global	Nearly global	Concentrated in North America and Europe
Intermediation	Local workers + service consumers	Spatially disparate sellers + buyers or producers + consumers	Capital owners + renters	Spatially disparate web users + advertisers	Spatially disparate companies
Forms of Value Creation and Capture	Network effects; transaction fees	Network effects; transaction fees; product sales	Network effects; transaction fees	Network effects; advertising fees	Revenue sharing
Control Mechanisms	Centralized algorithmic control of drivers; user agreements; systems of valuation (e.g. ratings)	Centralized control of supply chains and logistics; systems of valuation (e.g. ratings); user agreements with sellers; data manipulation	User agreements; systems of valuation (e.g. ratings)	Walled garden approach; control over consumer data	Centralized control of the core platform architecture upon which developers build; controlled access to marketplace platform
Other Activities	Uber Eats; Uber Freight	Amazon Web Services; Amazon Marketplace; Amazon Prime; Amazon Music; Whole Foods; Kindle; Fire TV; Echo; Alexa	Airbnb Experiences	G-Suite; Playstore; Android; Google Cloud; advertising products; Google Nest	Consulting and professional services; software products

Source: Authors' Formulation

Table 2: Spaces of Platform Capitalism II: Corporate Geographies

For all this diversity, however, there are cross-cutting characteristics too, some of which resonate with Braudel's depictions of world-economies, with their various cores, peripheries, intermediate zones, and "lines of force." According to Annabelle Gawer (2014, p. 1240), a feature common to all platforms is their reliance on "a modular technological architecture made up of a core and a periphery," which in turn is reflected in bespoke accounting regimes and novel architectures of control (see Kornberger et al., 2017). Organizationally, this materializes as a separation between a relatively stable core, under the direct control of platform owners,

and an array of "variable peripheral components" that are differently shaped and developed in conjunction with platform users (Baldwin & Woodward, 2009, p. 24). This, in turn, is related to particular regimes of power and control.

Vallas and Schor (2020, p. 273) argue that platforms succeed — in facilitating trade, connecting users, or capturing value — when they are able to "externalize responsibility and control over economic transactions while still exercising concentrated power." Kornberger et al. (2017, p. 79) likewise explain that while the operational reach of platforms is "radically distributed," a largely invariant condition is that "power remains centralized." As Table 2 illustrates, platform operators centralize and concentrate power in diverse ways, but they all do it: labor platforms like Uber deploy algorithmic systems and regulatory evasion to manage a distributed fleet of nominally self-employed drivers; capital platforms like Airbnb reserve their right to exclude users and to ban some rental activities; innovation platforms like Salesforce retain control over the operating system upon which other applications are built. The monopolization of information on platform participants, their transactions, and even their desires, is the key resource in this context; in contrast to the always-imperfect information possessed by conventional market actors, platform operators are positioned so as to monitor all sides of the transactional relation, actual and potential, mobilizing modes of long-distance surveillance and control that for Braudel would have been unimaginable — albeit in a strange way predictable. As Tim Wu (2018, p. 11) has protested, the overlords of today's platform fiefdoms "seem to know too much about us," exercising "too much power over what we see, hear, do, and even feel."

5 Conclusion: Platform Power

In July 2020, Jeff Bezos of Amazon, Tim Cook of Apple, Mark Zuckerberg of Facebook, and Sundar Pichai of Alphabet were summoned to appear before a panel of the United States Congress investigating allegations of antitrust violations and other abuses of power, position, and privilege, a confrontation that some commentators likened to the long-delayed moment of judgment faced by Big Tobacco a generation before. The confrontation was anticlimactic, but could yet mark a milestone in a regulatory struggle that seems destined to last for years (see Kang et al., 2020; Subcommittee on Antitrust, Commercial and Administrative Law, 2020). The day after the hearings, as chance would have it, the Big Four reported their quarterly earnings. In the throes of an unprecedented collapse of the U.S. economy, ravaged by the COVID-19 pandemic, the platform firms were thriving. Facebook's profits almost doubled from the previous year, while Amazon reported a 40% increase in sales, the Big Four posting combined profits of $28.6 billion for a quarter in which their aggregate market capitalization ballooned to $5 trillion. Alongside Big Pharma, the platform giants have been the most significant beneficiaries of the global crisis triggered by the pandemic (see Financial Times, 2020). Even though, in the early stages of the crisis, the platform operators "felt some sting from the spending slowdown," Wakabayashi et al (2020, p. B1) report, this new generation of corporate giants would demonstrate once again, as occupants of the commanding heights of digital capitalism, that "they are operating on a different playing field from the rest of the economy."

In the space of two decades, the world's leading platform operators have consolidated positions at the weakly-regulated summit of contemporary capitalism. Taking our cues here from the creative formulations of Fernand Braudel, for whom capitalist power is always exercised from a "narrow platform" (Braudel, 1977, p. 113; Day, 1980, p. 108), we have argued in this paper that platforms represent a "new business model *within* capitalism" (Srnicek, 2017b, p. 254,

emphasis added), but also that they also stand for something more specific than that — as new machines for the concentration of power and the monopolization of markets, working from that "restricted layer" that Braudel called the antimarket, newly constituted as a placeless place in the clouds with its very own breed of great predators. In a context such as this, which might be regarded as both familiar and strange, one of the benefits of traveling with Braudel is that inquiries pointedly *begin* with monopoly power and anticompetitive practices, rather with notions of technologically induced disruption, or the magical properties of network effects.

Platform capitalism, we have argued, represents more than a new way of delivering the goods (cf. Robinson, 1962), but functions as a machine for concentrating and exploiting political-economic power. The monopoly practices of platform corporations, as Christophers (2020) has demonstrated, are a defining feature of this system, not an anomaly or a bug. This defining feature, however, should not be confused with an eternal and mechanically produced characteristic, since the conjunctural condition of platform capitalism is neither stable nor free of contradiction. As Grabher & König (2020, p. 110) conclude, "the various institutional configurations and regulatory regimes of [the] platform economy" are still very much "in the making," leaving open a host of questions concerning how the platform model "might be combined with, or live alongside other governance models, in various degrees of contradiction or complementarity." And as Julie Cohen (2019) has argued, also striking a Polanyian tone, the distinctive dynamics of platformization will surely be met with countermeasures and countermovements, although the content and consequences of these counteractions are ultimately matters of politics, not functional predetermination. The institutional legacies of double movements played out in the previous century, however, seem to be ill-matched for this challenging task. New modalities of counterpolitics will surely be required, given the nature of this particular beast.

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The Rise of Online Platforms and the Triumph of the Corporation

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Abstract

Rather than viewing online platforms as digital marketplaces, we analyze platforms as corporations and platform participants as a workforce. Online platforms perform very similar functions as any other corporation, but in different ways (applying terms and conditions as a legal framework and data, reviews, and algorithms for decentralized control) and mostly in different contexts (informal labor markets, sharing communities, social media) than traditional corporations did hitherto. The corporation perspective helps us to understand the transformative power of platforms, while at the same time shedding light on the historical continuation of the corporation as a basic institution in society. We argue that platforms' transformative capacity lies in their continuous development of new institutions that they impose on their workforce and their clientele, codified in terms and conditions. It is the re-coding capacity that provides platforms the ability to continuously adapt the course of institutionalization in largely autonomous manners.

Keywords: platform; corporation; governance; gig economy; sharing economy; social media.

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1 Introduction

In November 2013, home sharing platform *Airbnb* organized a rally for its hosts in the face of regulatory restrictions in the city of New York. As reported by Bradshaw (2013), *Airbnb*'s founder Brian Chesky told his audience: "*This is the new economy, a sharing economy, (...) It's starting to feel like a revolution (...) We can take the power back*." Regarding the city's imminent regulatory restrictions, he argued: "*Fundamentally here is the problem: there are laws for people and there are laws for business but you are a new category, a third category — people as businesses. As hosts, you are micro-entrepreneurs and there are no laws written for micro-entrepreneurs*."

Airbnb's frame evokes an image that individuals can do without large corporations by entering into direct "peer-to-peer" interactions reminiscent of the early days of the Internet when many believed it to be a force for empowerment (Schor, 2016). Politically, the quote puts forward the claim that online platforms operate in a "legal void", as if existing laws and regulations would be inconsistent with innovation (Elert & Henrekson, 2016). Uber followed a similar discursive strategy arguing that laws and regulations are outdated and do not keep up with the pace of innovation embraced by users (Pelzer et al., 2019).

The framing of online sharing platforms as digital marketplaces that support individual people to make money as a "micro-entrepreneur", is a pervasive one. It applies to a variety of contexts ranging from hosts on *Airbnb*, drivers on *Uber*, vloggers on *Youtube*, writers on *Amazon* and taskers on *TaskRabbit* (Kenney & Zysman, 2016; Schor, 2016). Following the reasoning that platforms drastically reduce transaction costs, some contemplate an economy that can "*survive without corporations*" (Davis, 2016), and others predict "*the end of employment*" (Sundararajan, 2017).

Consistent with this framing, online platforms legally define "micro-entrepreneurs" as hobbyists, partners or else as independent contractors. Platform companies view individuals offering products or services as independent businesses on a digital marketplace, just using the platform to reach out to their clients, who pay either directly or indirectly through targeted advertisement.

Following the common understanding of online platforms as digital marketplaces, it is meaningful to compare platforms with traditional market intermediaries. Social media platforms, for example, are similar to traditional media (TV, newspapers) in that content attracts viewers whose "eyeballs" serve as sales channel for advertisements. And, taxi-hailing apps such as *Uber* and *Lyft* perform the same function as traditional telephone operators in connecting a passenger to a driver in real time. These historical analogies help to discern the innovative — and transformative — nature of online platforms. In providing intermediary services to a large group of participants that they can govern digitally, they act as infrastructures (Grabher & König, 2020). Different from traditional market intermediaries platforms have the capacity to systematically track the location, behavior, production, choices, transactions and reviews of millions of people. In addition, classifying and storing information as big data ("datafication") allows them to resell or use that information in targeted ads ("commodification") and to feed algorithms, which prioritize certain topics, persons or offers over others ("selection") (Van Dijck & al., 2018). Platforms thus claim ownership of data generated by the actions of participants, while participants — having accepted the terms and conditions — have no insight into how their data is used later on nor get a share of the surplus generated by those activities.

In the spirit of Polanyi (1977), then, one may argue that the notion of online platforms as digital marketplaces reducing transaction costs suffers from an economistic fallacy. First, platforms do not simply intermediate transactions. They also exercise asymmetric power over the

participants they connect, acting as "private regulators" (Boudreau & Hagiu, 2009). They can govern the actions of market participants through their infrastructural power to disconnect them from the platform at will as well as through their algorithmic power to rank them high or low depending on past behaviours (Van Dijck et al., 2018). Second, while transaction costs are drastically reduced by platforms, the true costs of participation can be high. The conversion of employment into independent contracting implies that individual workers receive no monetary compensation for things like search efforts, review writing and waiting time (Drahokoupil & Piasna, 2017). Taken this reasoning one step further, one could argue that the sheer presence of participants on a platform leaves data traces that are commodified without monetary compensation. Hence, the notion of digital marketplaces would logically not apply given that the data itself are not transacted (Zuboff, 2019).

Following these critiques on the dominant understanding of online platforms as digital marketplaces, we aim to develop a mirror-image conceptualization of online platforms as corporations. We want to showcase how the development of the platform economy can be interpreted as the triumph of the corporation, evidenced in particular by the platform's increasing take-over of critical intermediary functions on the market and in society as a whole (which were previously performed by non-corporate actors). We specifically reflect on online platforms that extract value from and govern the work carried out by participants performing (paid and unpaid) labor, referring to gig work, asset sharing and social media. We propose to understand online platforms first and foremost as corporations and platform participants as workforce. Online platforms perform very similar functions as any other corporation, but in largely different ways (applying terms and conditions as a legal framework and data, reviews, and algorithms for decentralized control) and largely different contexts (informal labor markets, sharing practices, social media) than traditional corporations did hitherto. In essence, platforms manage their workforce with a capacity similar to traditional corporations and in the interest of its investors, but without the formal obligations that traditional corporations face regarding their employees and other stakeholders. The corporation perspective thus helps us to understand the transformative power of platforms, but as a historical continuation of the corporation as a basic institution in society. Rather than arguing that online platforms operate as "evasive entrepreneurs" in a "legal void" working around outdated laws and regulations (Elert & Henrekson, 2016), we will emphasize that their transformative capacity lies in their continuous development of new institutions that they impose on their workforce and their clientele, codified in terms and conditions. It is this re-coding capacity that provides platforms the ability to continuously adapt the course of institutionalization in largely autonomous manners.

Our essay being preliminary, the aim is to invite scholars studying corporations in different disciplines to join our efforts to understand the analytical specificities and historical roots of platform capitalism (Langley & Leyshon, 2017; Rahman & Thelen, 2019). We see the corporation perspective as just one window on a multifaceted phenomenon, and as complementary to other theoretical perspectives that equally emphasize the new modes of governance introduced by online platforms, including the frameworks of organization-of-markets (Ahrne et al., 2015; Kirchner & Schüßler, 2018), evaluative-infrastructure approach (Kornberger et al., 2017) and the Möbius organizational form (Watkins & Stark, 2018).

2 Platform as Corporation

The corporation can be considered one of the most central institutions of the capitalist West. Organizational sociologists have long observed the global expansion of formal organization in

many areas of society, documenting a dramatic increase of organizations of all sorts, especially after World War II (Drori et al., 2006). This expansion also concerns the for-profit sector, where the corporate firm has become the most common organizational form, ranging from small and medium-sized enterprises to transnational corporations (Chandler & Mazlich, 2005). Although there is empirical evidence of corporations existing as a way of organizing economic activities for centuries, the corporation, as we know it today, became dominant in the wake of the industrial revolution with mass production and distribution. While many variations of corporations exist today, it is possible to deduce a certain underlying institutional logic of the ideal-type corporation (Thornton et al., 2012). There are codified exemplars of the modern corporation, probably best represented by Chandler's (1962) seminal classification of firms into unitary form (U-form) or multidivisional form (M-form), each with its own implication for managerial strategy and transaction costs. The ideal-typical goal of the modern, Chandlerian corporation is to grow in size by geographic or product diversification. While scholars have found a variety of corporate governance forms that go beyond the simplicity of this classification (Fligstein & Freeland 1995), it is still possible to deduce a particular institutional logic of the corporation that specifies the unique sources of identity, authority and legitimacy as well as particular mechanisms for formal and informal control that differ from the ones applied in other social contexts, such as in the family, the community or the church (Thornton et al., 2012). Corporations are characterized by limited liability and their basis for membership is the employment contract. Members are organized within a bureaucratic hierarchy led by a board of directors with formal authority. The bureaucratic hierarchy also maps out the typical career paths for individuals to climb the corporate ladder.

Corporations have also been described as a corner stone of managerial capitalism and are heavily intertwined with market institutions (Friedland & Alford, 1991; Fligstein, 2002). As such, corporations have become an integral part of the twentieth century welfare state, consisting of layers of institutions and actors created to facilitate their operations, such as anti-trust laws, wage negotiation by unions and industry associations, and labor laws promoting decent work. At the same time, having an employment contract is often essential for individuals to obtain insurances, pension, social security numbers and other welfare benefits. The fundamental role of corporations in today's society is thus important to note in order to understand the transformative effects that platforms might have.

Viewing online platforms as corporations, then, may seem an obvious perspective in at least two respects. First, most online platforms are corporations in a legal sense, profit-oriented and initially backed by venture capital with the aim to have its shares traded later on via an IPO. While the simple fact that most platforms are corporations is well-known and seldom ignored, only few take a corporation perspective as starting point for theorizing (*e.g.*, Zuboff, 2019).

A second reason for approaching the platform from a corporation perspective is that they manage a "workforce" just as traditional corporations do. In this context, it is telling that Human Resource Management (HRM) scholars are among the most active theorists on platforms by now (for a review, see Duggan et al., 2020). Despite the absence of an identifiable employment relationship, platforms apply various HRM techniques to their workforce (Meijerink & Keegan, 2019), such as algorithmic content moderation or removal (*e.g.*, following low ratings or written complaints), reward schemes for high-performing individuals (*e.g.*, by higher search rankings or higher payment per view), and deactivation or "dismissal" in traditional HRM terms. While this HRM perspective on platforms focuses on the so-called "*gig economy*" where a requester hires an independent contractor via an online platform, the HRM principles stretch beyond paid gigs. Social media platforms, for example, equally police participation, moderate

content and reward high performers (Van Dijck et al., 2018).

From a Marxist point of view, approaching the platform as essentially a corporation makes perfect sense. Platforms retain the right to fully appropriate the information content and digital traces generated by their workforce as "free labor", thus extracting the surplus from labor as any other corporation does (Terranova, 2000; Zuboff, 2019). In this process, platform users train algorithms with data that are subsequently used to provide personalized recommendation services that could deskill professional workers. It is no coincident that platforms' algorithms initially mainly substituted low-skill work in private sectors such as travel agencies, telephone operators, and retail shops. By now, however, they also target high-skilled jobs, mainly located in public sectors, by providing algorithmic "expert advice" to support professionals in media, education, and healthcare (Van Dijck et al., 2018).

Yet, there are differences in the balance of power between the platform corporation and its platform workers, and between a traditional corporation and its employees. On the one hand, a platform can exercise more economic power over their independent workers than traditional companies over their unionized employees because price fixing among independent contractors is prevented by anti-trust law. While other forms of unionization may be allowed, platform workers are not easily united given that they do not share a workplace and are highly heterogeneous in backgrounds and earnings (Schor et al., 2020). On the other hand, platforms exercise less power over its workers, as the latter can easily switch to competing platforms or even work for multiple platforms at the same time ("multi-homing") (even though platform workers cannot transfer their reviews from one platform to the other in most cases). What is more, workers can also try to enter into repeat transactions with requesters outside the platform, thus avoiding having to pay a commission, a practice that some platforms actively try to punish (Schor et al., 2020).

In view of the differences between platform corporations and traditional corporations, some argue that platforms should be understood as hybrid organizations combining the institutional logics of the corporation and the market (Altman et al., 2019). As Greenwood et al. (2011) argued: "*To the extent that the prescriptions and proscriptions of different logics are incompatible, or at least appear to be so, they inevitably generate challenges and tensions for organizations exposed to them*" (p. 318). A platform qualifies as a hybrid organization in that they apply "a corporation logic" to manage its workforce as just explained, but they do so by transacting with them — and having them transact with clientele — following a "market logic" (Frenken et al., 2020). And, in some cases, the workforce itself follows community principles, adding a third "community logic" (Watkins & Stark, 2018; Grinevich et al., 2019; Vaskelainen & Münzel, 2018). Yet, to study a platform as a hybrid organization sheds little light on the platform as a contested phenomenon, because platforms have found a way to render the corporate and market logic complementary rather than conflicting. It combines the managerial capacity of the cooperation with the flexibility of the market, thus circumventing the whole regulatory apparatus, and the associated costs, that protects workers with an employee-status. It is only at the level of workers that logics become conflicting, as workers are classified as independent contractors (*viz.* a one-person "corporation") but do not enjoy the market freedoms that generally go with it (Frenken et al., 2020).

Rather than viewing online platforms as hybrid organizations, we consider platforms a new corporate form, one with a specific capacity to control a workforce without employing them. In this context, the useful notion of platforms as "evaluative infrastructures" has been put forward (Kornberger et al., 2017). Platforms make use of the ratings and reviews of clientele in the algorithimic assignment of tasks to their workforce, be it directly or through rankings in search

listings. The ratings and reviews are supplemented with platform's own surveillance data collected by tracking and tracing platform participants (*e.g.*, using GPS, time to response, time to completion, etc.) that can be fed into the algorithm, and, in some cases, as human "community manager" who is nevertheless not employed by the platform (Reischauer & Mair, 2018; Watkins & Stark, 2018).

Following Kornberger et al. (2017), platform corporations implement quality control in rather different ways from traditional corporations. As a private regulator, a platform assumes quality control functions traditionally delegated to government agencies or professional organizations. In principle, platforms allow anyone to enter, but exercise surveillance on "workforce" *ex durante* (through algorithmic moderation) and *ex post* (as negative reviews may lead to discontinuation). In these ways, platforms can maintain a certain quality level, without making use of codified quality criteria otherwise. This type of governance is in stark contrast to traditional markets where quality is typically maintained by professional criteria that are enforced by professional organizations as well as consumer and labour protection regulations enforced by the state. Regulations, licences, diplomas and labels all attempt to maintain quality and protect consumers and workers, for example, regarding health and safety and contract enforcement.

The specific organizational innovation, then, concerns a technology for decentralized control while retaining centralized power in the hands of the platform corporation (Kornberger et al., 2017). It is this combination of decentralized control and centralized power that makes the platform a new corporate form, allowing it to handle a much more heterogeneous workforce than traditional corporations (Schor et al., 2020). The platform's "retreat" from control grants workers the freedom to engage in multi-homing and, by and large, to create their own social media content, rent out whatever goods they own, or carry out whatever service they want to offer. This then explains why the backgrounds, motivations and earnings of the workforce of a single platform vary so much, despite the fact that they are all subject to the same evaluative infrastructure (Schor et al., 2020). Heterogeneity in the workforce is a direct result of ceding management to technology. The platforms also "retreats" from controlling hours, scheduling, and the labor process because the algorithm plus reviews can handle the allocation and surveillance of tasks. However, in contrast to true "free" markets, firms do have power over workers in ways that the market logic — and the economic theory of markets — does not account for (McKee, 2017; Schor et al., 2020).

Online platforms thus "disembed" themselves from traditional institutions codified in laws and regulations and maintained in professional codes and practices. They do so in explicit manners following Silicon Valley's adagium "*Don't ask permission, ask forgiveness*" (Kenney & Zysman, 2016, p. 67). *Uber*, for example, has explicitly framed its support to illegal drivers as legitimate referring to government regulation and the taxi profession as outdated and against innovation (Pelzer et al., 2019). And *Airbnb* claimed that there are no clear laws written for homesharing and that it should thus not be forbidden under current law (Stabrowski, 2017). However, the mere fact that platforms do not comply to regulations and governments have difficulties enforcing them does not imply that platforms operate in a "legal void" (Elert & Henrekson, 2016), also called a "formal institutional void" (Bothello et al., 2019). On the contrary, a platform's main selling point is to provide an institutional infrastructure so that multiple parties can interact online in predictable manners. To say that platforms are operating in a void is meaningful only from a historical perspective as they challenge the *existing* institutions by largely by-passing them. As platforms unilaterally impose rules on their participants — who have to accept the terms and conditions before entering the platform — they act as "private regulators" (Boudreau & Hagiu, 2009) in moderating interactions online. Put differ-

ently: "*platform operators, then, co-produce their own institutional and societal embeddedness*" (Grabher & Van Tuijl, 2020, p. 1012).

The terms and conditions imposed by gig economy platforms are generally quite explicit in defining the platform's workforce as independent contractors and the platform as an intermediation service that assumes no responsibility for the performance of its users (Prassl & Risak, 2015). At the same time, the platform retains the right to exclude listings or users at will. In similar ways, social media do not accept any formal responsibility for the content that users post, but nevertheless curate by removing particular content (Helberger et al., 2018). What is more, as platforms have a great interest in quality control and good reputation of their participants, they tend to make participation in dispute resolution *by the platform* also part of their terms and conditions. There are strong incentives for participants to engage in platform's resolution of disputes, as they risk to be excluded from the platform if they refuse to do so (Gamito, 2017). This mode of governance by platforms can thus be considered as a form of "private governance" given that, as a private actor, the platform takes on the role of regulator, implementer and dispute resolution body at the same time (Ulfbeck et al., 2018). It is this new mode of governance, encoded in terms and conditions, which sets platform corporations apart from traditional corporations that employ their workers (Daugareilh et al., 2019).

Terms and conditions, however, are not set in stone. On the contrary, the versatility of platforms lies in its ability to swiftly change the exact terms and conditions. In this way, platforms do not only adapt their business models to commercial opportunities but also to changing regulatory contexts (Van Dijck et al., 2018). Just as their technological capacities evolve through changes in the software codes, so do platforms evolve — or better "recode" — their formal institutional embedding through ongoing adjustments in their terms and conditions. This versatility is made possible by the absence of labor contracts with their workforce and their "asset-light" nature where capital assets are owned and maintained by members of the workforce themselves (houses, cars, telephones, etc.). This also explains why attempts by traditional businesses or unions to bring platforms to court with reference to alleged breaches of competition, consumer or labor laws or local regulations have had only limited effects (Koutsimpogiorgos et al., 2020). If rulings provide any clarity at all, platforms can quickly re-code their software and/or alter their terms and conditions, creating a new artifact with slightly different workings that would necessitate a new court case, and so forth. The re-coding capacity provides platforms the ability to continuously adapt the course of institutionalization in largely autonomous manners.

3 Situating Platform Capitalism

Having discussed online platforms from a corporation perspective in an analytical sense, we now turn to one particular spatial-historical context in which online platforms have become very active: continental Europe. It is in this particular context that online platforms have lost some of the legitimacy that they had initially built up as innovative starts-ups. The main concern that has emerged concerns the mismatch between the classification of platform workers as independent contractors on the one hand and the social security organized around labor employed by traditional corporations on the other hand (Koutsimpogiorgos et al., 2020). The increasing number of people earning an income via platforms instead of a formal employment contract is challenging the foundations of the twentieth century welfare state regime. Fewer people share risks in collective social security arrangements, which causes low-paid, high-risk

platform work to become more precarious and high-paid, low-risk platform work to be more lucrative because they save on collective insurance contributions (Schor et al., 2020).

From a labor law perspective, the control that platforms exercise over independent contractors would possibly qualify the platform as employer and platform workers as employees (De Stefano, 2016; Prassl, 2018). Following this legal reasoning, there are various attempts by unions and labor parties across Europe to change the current status of platform workers as independent contractors into a status of employees of the platform. If these attempts would succeed, gig work would be re-institutionalized into the established corporate logic including employee status, social protection and union representation. Yet, in such a future development, the platform as a new organizational form would not cease to exist. The employee status — if granted at all to platform workers — is likely to apply only to platforms that exercise substantial control over workers by algorithmic matching and pricing (e.g., in taxi and delivery sectors) (Koutsimpogiorgos et al., 2020). In sectors where the workforce enjoys more freedom to select assignments and set prices (e.g., odd jobs, cleaning, asset sharing) or does not receive monetary compensation (e.g., social media), it remains unlikely that the employee status will be instated. What is more, even for platform workers with an employee status, it holds that they can still be managed by algorithms exercising decentralized control, with flexible working hours maintained by zero-hour contracts or via temp agencies. Thus, a theoretical approach to platforms as corporations remains valid in case (some) platform workers will acquire an employee status in the future.

In an institutional perspective, the emergence of online platforms is best understood as a gradual rather than a disruptive type of development (Hinings et al., 2018). Situating this development in Europe, one could argue that recent reforms in welfare state arrangements preceding the advent of online platforms, may actually have been supportive to the rise of platforms. Notably, the emphasis on tenure employment was loosened with the institutionalization of more flexible work contracts, zero-hour contracts and temp agencies (Stanford, 2017; Hyman, 2018). In this sense, the platform model cannot be considered to be functionally discontinuous with preceding corporate forms and the labor laws supporting them.

Unlike the popular notion that many traditional businesses are disrupted by online platforms, it should be noted that platforms have mostly come to dominate in historically "anomalous" contexts where traditional corporations — and their welfare arrangements — were largely absent or progressively contracted in recent decades. Second-hand markets, taxi rides, food delivery and home cleaning all serve as examples where informal practices co-existed next to formalized ones (Koutsimpogiorgos et al., 2020). And, in historically more formalized markets such as programming, translating and editing, corporations were anyway of limited importance, given that most of such work was already done by independent contractors before the advent of platforms. Social media platforms, in this sense, may be considered most disruptive as it disrupted the ad-based business model of traditional media companies with severe consequences for the profession of journalism (Van Dijck et al., 2018).

The sharing economy is another historical context, in which online platforms successfully penetrated (Frenken & Schor, 2017; Van Dijck et al., 2018)). Before the advent of platforms, sharing consumer goods was a standing social practice — especially among those with low income — where people carpool to work and lend out their possessions to family, friends and neighbours. Similar to gig platforms, today's sharing platforms have extended and expanded this informal practice beyond this trusted circle, also called "stranger sharing" (Schor, 2016). Analogously, people historically shared pictures and stories among family and friends, but now post content on social media platforms reaching out to a larger audience (Van Dijck et al., 2018;

Watkins & Stark, 2018). Now that platforms economize private possessions and cultural content, it may lead to the crowding out of (offline) altruistic sharing in a community logic in favor of online participation on platforms, although this claim has remained under-researched (Frenken & Schor, 2017).

4 Concluding Remarks

We can conclude that platforms have mostly entered in contexts where the corporation — and the social security and government regulations tied to it — was largely absent. This also explains why the advent of platforms in such contexts, in particular their self-regulatory capacity, may present attractive benefits to governments. Given the government's own inability to guarantee the security of workers and consumers in "informal" industries, platforms can present themselves as legitimate in "formalizing" these industries, claiming to protect the interests of their workers and their clientele by reviews and rating and — in some cases — even insurances. If the trend towards formalization progresses, government can more effectively tax activities that hitherto remain largely under the radar of tax offices.

There are certainly also industry contexts where platform corporations compete head to head with traditional corporations. Notable examples are the music, media, TV, tourism, retail and transportation industries. It would, however, be too early to claim that traditional corporations are severely undermined. Either way, as we have tried to argue, the corporation would triumph. That is, the key transformation unfolding with the advent of platform capitalism does not lie in the disruption of traditional corporations by online platforms, but in the ways the corporation — as an institution — is embedded in society. Where traditional corporations found a way to pacify their conflicts with employees in a national welfare state system through institutionalized negotiation with unions that are sanctioned by government, platforms hitherto govern their workforce outside such established arrangements by relying on their own governance capacities.

Following our analysis of the platform economy, one specific question that remains is whether the levels of social security that employees in some parts of the world have grown accustomed to, will be further hollowed out by more flexible labor contracts and independent contracting, or whether the social security arrangements will be re-invented in ways that detach them from their almost automatic coupling with an employment contract. For example, social security rights and obligations can be made universal and compulsory for anyone earning income (including a potential universal income given out by the state), regardless of their status as an employee, independent contractor, student or retiree. This could create a level-playing field for platform work and work done by employees, as a point of convergence of the traditional welfare state regime and the newly emerging platform regime. Alternatively, a parallel social security system can be developed for low-paid platform workers by having them organize in insurance cooperatives. The latter arrangement would further set the two regimes apart, but nevertheless be legitimate as the underlying values of social protection are transferred from the welfare state to the platform regime.

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Platform Works as Stack Economization: Cryptocurrency Markets and Exchanges in Perspective

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Abstract

What is an economic platform? I address this question by focusing on the case of cryptocurrency exchange platforms. The research draws on interviews with platform actors, fieldwork in one exchange, and computational text analysis of the terms of service of all cryptocurrency exchanges in the world. I argue that cryptocurrency exchange platforms go beyond market processes by fulfilling a variety of functions including banking, infrastructure development, gift-giving, barter, money making, payment system operation, software production, security providing, and centralized extra-blockchain accounting. I propose the concept of "stack" to describe such a process of socio-digital economization that takes place in these data money exchanges. Demonstrating that it is inadequate to describe platforms as mere digital infrastructures, devices, places or markets, I argue that cryptocurrency exchange platforms can best be understood as economization stacks that weave multiple layers and types of interaction, and facilitate an empirically observable range of variegated economic activities.

Keywords: Cryptocurrency; Blockchain; Money; Market; Platform.

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1 Introduction and Literatures

The first decade of the twenty-first century marked a curious double movement. As markets collapsed with an extraordinary velocity, we witnessed the simultaneous emergence of the most varied money and most rapidly emerging market form in history. In the decade following the 2007–2008 financial breakdown, 30,677 new cryptocurrency markets emerged across the world. As of October 2020, 7,307 cryptocurrencies — or, better put, *data monies*[1] — are exchanged around the clock, under the digital roof of 339 centralized exchange platforms. These platforms have no closing or opening time, and they enjoy a market cap of more than one trillion USD, an economy larger than the GDP of 92% of the countries in the world as of January 2021. This marks an unprecedented expansion of markets in recent economic history.

As these new markets and institutions begin to dot the landscape of our planet, early approaches to cryptocurrencies and their blockchains have gravitated towards mobilizing a discourse of revolution, a fundamentally new economic future that does not need formal institutions. This was a rupture talk about cryptocurrencies, a style of popular and scientific thought in need of observing a categorical break from the past (Hecht, 2002).

A popular book on cryptocurrencies has announced a blockchain revolution to the world: For the Tapscotts, blockchains are providing "the new digital economy" with optimal solutions addressing problems of trust without the need for intermediaries such as formal markets, accounting institutions, and states (Tapscott & Tapscott, 2016). Such a rupture talk has entailed an investment in mobilizing a public sentiment about data monies' advantages and necessity. There also exist equally popular negative sentiments about cryptocurrencies. One has called Bitcoin "a greater fool's gold" (*The Guardian*, 2018).

Academic literature has taken yet another way. Social studies of cryptocurrencies have shown that these currencies have been displaying characteristics in rapport with a preceding understanding of money as process, produced and maintained by social relations amid political institutions (Dodd, 2018; Rella, 2020). Contesting the exaggerated notion of economic rupture, researchers have demonstrated the political qualities of "trustless" blockchains, things designed to be extra-political in essence (DuPont, 2019), the oligopolistic tendencies of mining pools (Swartz, 2017), the ways in which new institutions were mushrooming around cryptocurrencies (Nelms et al., 2018), and how blockchain communities build social institutions to make them active in the first place (Crandall, 2019; Thieser, 2019).

Researchers drawing on micro-economic assumptions have also seen a continuity and, therefore, and used old ways of approaching this new type of money and platform by studying cryptocurrency trading (Kyriazis, 2019; Urquhart, 2016), financial assetization and pricing (Giudici & Abu-Hashish, 2019), price volatility (Katsiampa, 2017: Katsiampa et al., 2019), and trading regulations (Corbet et al., 2019).

Such a burgeoning literature, in part made possible by the abundance of data concerning data monies and the ease of finding them, has emerged with an ironic twist. Despite the fact that it is common knowledge that price manipulations are rampant in these markets, many researchers have not shied away from drawing on data collected by a handful of webpages that

1. This paper understands blockchains as actor-network assemblages that facilitate the imagining and transfer of economic value, by digitally representing this value as a *right to move data* securely. Drawing on the materiality of financializing the right to send data, data monies are made in ways that are historically and categorically different from paper or metal monies, or their fiat digital representations. For a detailed discussion and definitions, see Caliskan, 2020; for the raw data of white papers corpus text and R code, see Caliskan & Birbil (2020).

do not filter out wash-trading.[2] A great majority of papers written on data money markets and their prices is based on historical market price data from CoinMarketCap.com, one of the most popular market information websites for data monies. Yet, as has been shown by the Blockchain Transparency Institute, many of these webpages have been hiding the extent of wash-trading in data money exchanges. It has been shown that, until 2018, at least 7 of the top 10 exchanges carried out wash trading (BTI, 2018).

Even though such manipulative practices are now mostly factored out,[3] there is further evidence that the nature of market prices' realization on the ground should be studied, and not taken for granted as mere data. Researchers who draw on posted prices to understand markets operate on the assumption that there is no essential difference between data monies and pork bellies, when it comes to studying their markets. Both are things that people want, with their utilities subjectively defined. As a result, their prices can be analyzed to make sense of their markets.

A heterodox literature informed by socio-technical market research has already demonstrated the problems with approaching markets by simply looking at their prices. Social studies of price, worth, and value have exposed the socio-political and cultural context of attaching monetary value to things in concrete settings (Alexander & Alexander, 1991; Helgesson & Muniesa, 2013; Güran, 2020; Guyer, 2004; Stark, 2009; Velthuis, 2003). Scholars have shown that pricing is an instrument of market power and that it should not be taken for granted as a mere signal or neutral data to analyze the very markets that they make (Caliskan, 2005; 2007; 2009; Geismar, 2001; Pigounidès, 2020; Uzzi & Lancaster, 2004). Seemingly neutral formulas in "calculating" prices have always been inversion tools, representing the power of market actors who write those formulas more than displaying the neutrality of the market price itself (Lépinay, 2007; MacKenzie, 2006).

The need to move beyond prices to understand markets has been further underlined by a variety of socio-technical approaches to markets that call for a more dynamic and multi-variable study of markets. Researchers have demonstrated that trading infrastructures (Star, 1999), the very nature of the commodity (Mitchell, 2011), their legal context (Riles, 2004), metrological systems of measurement (Mallard, 1998), the social and political organizations of market actors (Uzzi, 1996), and discourses and techno-scientific knowledge (Grabher & König, 2017) contributed to marketization processes on the ground. These are not processes that happen *before* the market, giving markets a condition of possibility. They constitute concrete market-making, and they are endogenous to working markets, not exogenous factors such as an external scaffold encircling an imagined real thing.

Despite such a *glasnost* in market research, I argue that cryptocurrency markets present a fundamental challenge to our understanding of contemporary markets. These markets operate on digital platforms which go beyond marketization that facilitates exchanging as the main activity. It is not only market objects that are supplied and demanded, but their very markets, too. Furthermore, frequently defining themselves as "exchange platforms," these new markets organize their economization infrastructure to function simultaneously as *mints* that make data monies, *banks* that lend money for trading and charge various forms of interest rate, *vaults* and *security* institutions that present their clients with safe deposit locations, *insurance*

2. Wash-trading is a market manipulation practice whereby the same legal person, acting simultaneously as buyer and seller, transfers the ownership of an underlying asset between two accounts that she/he controls in order to produce misleading activity in the market.

3. According to the 2020 report of BTI, "only 31% of the CMC top 25 is being wash-traded compared to over 90% just 1 year ago" (BTI, 2020, p. 1).

agents that sell insurance against digital theft, *data centers* that sell and process information, *clearing houses* for various transactions, *accounting agencies* that bring together double-entry book keeping with blockchain accounting, and, in a few cases, even as *courthouses* that run arbitration cases. For instance, Coinbase, one of the largest cryptocurrency exchanges in the world, with 35 million users in more than 100 countries, describes itself as "a wallet, an exchange, and a set of tools for merchants, all built on the same platform."[4] (Coinbase, 2020).

Almost any exchange in the world has ancillary business formations, such as information marketing, built around their primary objective of facilitating trade. However, for most of the data money exchange platforms, non-trading activities are not ancillary, but among core economic engagements and sources of revenue. What, then, is a platform? How to describe cryptocurrency exchange platforms that have more functions now than a mere trading?

Economic platformization started in the commodities. The earliest work on platforms focused on industrial organization, describing the qualities of industrial commodities that can be redesigned and remarketed from a new perspective (Wheelwright & Clark, 1992). Qualifying the "architecture of the product," and not the ground on which its production and exchange were carried out, these early studies have illustrated how "platform products" drew on a modular manufacturing principle that brought together various core and ancillary components. SONY's Walkman were among those platform products whose parts lend themselves to be used in other platform products (Sanderson & Uzumeri, 1995; Ulrich, 1995).

The new century came with digitizing everything, including products and the networks of their production and exchange. IBM's innovative product planning strategy was based on not curbing competition, but instead inducing cooperation with other companies by encouraging non-IBM elements to be used on IBM "platforms" (Flurry & Vicknair, 2001). Following public debates on the unprecedented experiences of IBM, scholars from management studies, economics, and law moved their attention from industrial products to digital platforms

Seeing economic platforms such as Amazon as "intermediation markets," Caillaud and Jullien (2001) have located the network effects of platforms without calling them platforms. Their choice was the term "cybermediary." It was not picked up. Wright, however, located economic platforms that entail exchange relations as *markets* that "involve two distinct types of users, each of whom obtains value from interacting with users of the opposite type. In these markets, platforms cater to both types of users in a way that allows them to influence the extent to which cross-user externalities are internalized" (Wright, 2003, p. 1). Rochet and Tirole have also approached exchange platforms as markets and proposed a model of platform competition with two-sided markets (Rochet & Tirole, 2003; 2006). For them, "a market with network externalities is a two-sided market if platforms can effectively cross-subsidize between different categories of end users that are parties to a transaction" (Rochet & Tirole, 2003, p. 1017–1018).

Enlarging the scope of analysis from market exchange to other modes of economization, researchers and platform designers have approached platforms as a *technology* of intermediation between different economic actors (Evans & Schmalensee, 2005) and as coordination *devices* deployed in network markets with effects (Ambrus & Argenziano, 2004), and as multisided digital *frameworks* that shape the terms on which participants interact with one another (Gawer,

4. The multiplication and intersectionality of these platform works empirically supports the call for a rapprochement between platform studies and infrastructure studies (Plantin et al., 2018). Furthermore, Jane Guyer's new iteration of platforms could also be interpreted in association with stack economization, an exercise that deserves writing of a new paper (Guyer, 2016). Of course, one should not forget that seemingly non-platform companies such as Walmart are being platformized with a great speed, seeking for us to rethink their social universe anew (Reich & Bearman, 2018).

2009). Drawing on these approaches, researchers have even developed tests to locate the nature of the two-sidedness of markets as economic platforms (Filistrucchi et al., 2012).

An influential OECD symposium that brought together expert delegations from twenty countries reached a consensus about seeing platforms as *firms* that operate two-sided markets with three elements: (1) the presence of two kinds of economic actors who rely on the platform to receive or send whatever they demand or supply; (2) the presence of indirect network externalities coming out of this economic relationship; and (3) the existence of a non-neutral price structure that depends on the decision of the platform owner (OECD, 2009).

Yet, such a proliferation of research concerning platforms tends not to locate the historical specificity and empirical novelty of exchange platforms, instead leans towards flattening their rich universe. It does so by seeing them as mere markets and thus giving a second life to an already shallow and empirically unfounded neoclassical notion of the market, this time in the study of economic platforms as two- or multi-sided markets.

Contributing to the literature that calls for deploying a dynamic perspective in the study of platforms (Bernards & Campbell-Verduyn, 2019; Langley & Leyshon, 2016; Westermeier, 2020), this paper argues that it is insufficient to see platforms as mere markets, let alone multi- or two-sided. The multi-purpose and dynamic universe of platforms exceeds marketization relations and mobilizes a series of business opportunities that can best be understood as *stack economization*, making it possible for platform actors to move beyond market making in pursuing diverse modes of economization from barter to money-making within a single frame. Theoretically, the paper draws on and expands the research program on economization and marketization (Caliskan & Callon, 2009; 2010). "Stack" is a term that computer science has borrowed from the world of kitchens. Referring to the stacking of data layers vertically, like plates standing on top of each other, the term describes the arrangement of multiple layers of representations — in this instance, data — in relation to each other. In this way, one layer supplies an ancillary ground for another to stand upon, while at the same time building a coherent framework of interoperation.

Economization refers to "the assembly and qualification of actions, devices and analytical/practical descriptions as 'economic' by social scientists and market actors" (Caliskan & Callon, 2009, p. 369). Calling for a move from a study of "the economy" as a mature, systemic object that claims to be independent of its qualifications, the economization program has called for locating the imagining of "the economy" itself in a study of economization that incorporate various modalities from exchange and production, barter and gift, and their hybrids, all taking place in association with certain socio-technical agencement or assemblage clusters.

Marketization, as a mode of economization, refers to the making and maintenance of sociotechnical agencements that (1) organize the conception, production, and trading of objects of exchange; (2) arrange constituents that deploy the rules, devices, infrastructures, representations, as well as the competencies and skills embodied in economic actors; and (3) construct a space of power struggles (Caliskan & Callon, 2010, p. 3). Associated with Actor-Network Theory, such a definition, instead of being a *theory* of markets, presents itself as an approach or a set of rules of thumb to analyze marketization.

This paper argues that the marketization program *cannot* account for organized cryptocurrency exchanges. An empirical analysis of these exchanges, their operations, and an ethnographic study of one the largest exchange platforms suggest that only a part of economic practices taking place in these markets can be captured by the concept of marketization. These exchanges harbor economic practices that exceed the marketization practices defined above. How to address this perplexing situation of new "markets" that go beyond being markets?

One possibility is to look at platformization as stacking. Bratton's work on stacked economic geographies has introduced the possibility of imagining computer sciences' technical term "stack" to the sociological imagery in an innovative way. For Bratton, a new socio-digital geography is emerging, with new possibilities of economic and political engagement. Calling this "new megastructure" the Stack (*sic.*), Bratton has theorized the *place* of interaction instead of the *process* of encounter itself and argued that this megastructure is also a platform (Bratton, 2015, p. xvii). He defines "the Stack" as "a planetary-scale computing system," "a megaarchitecture for how we divide up the world into sovereign spaces," "informed by the multilayered structure of software protocol stacks in which network technologies operate within a modular and interdependent vertical order" (Bratton, 2015, p. xvii).

This innovative spatial approach is theoretically similar to equating an exchange relationship with its building, the geography where it happens. Social geographical approaches to economic relations have many advantages, and Bratton's socio-digital rendering of the stack has informed both our understanding of the geographies of platformization and our potential to imagine interventions to contain their negative consequences. However, the quantitative and qualitative data I collected and analyzed on cryptocurrency exchanges suggest that what is being stacked is not a *place or geography* of encounter, but a *relationship* of economization. Furthermore, I did not observe any spatial formation in these economization relations which occurs in a unitary place one can describe with a "the" and a capital S, nor a larger reality like "the Stack," to which the platforms I studied belong. Much like economists locate "the Economy" as the totality of everything economic and use performative interventions to design it and make it happen, Bratton approaches fluid and non-systemic socio-economic processes as if they had a systemic and objective unitary framework, infrastructure or place. Such a perspective may be misleading from a scientific point of view, even though productive from a performative, political and strategically essentialist perspective.

Avoiding objectifying tendencies to see platformization as "the Stack," I argue that cryptocurrency exchange platforms entail the building of socio-digital spaces, the designing of instruments, and the imagining of new digital materialities that make possible stack economization. Stack Economization is a *research tool* with which I propose to study the rich universe of platform economies, not to explain or represent the totality of their practices or the nature of their host geography.

The research draws on three empirical engagements with cryptocurrency markets. First, I carried out fieldwork in a centralized cryptocurrency exchange I call X. I also visited a variety of other exchanges. None of these platforms gave me permission to use their real names. Second, I carried out unrecorded and recorded interviews with 74 persons working in or with those exchanges. No one except two gave me permission to record these interviews. Third, I studied the workings of 339 exchanges that operate more than 22,707 markets. 88 of these exchanges were small and operating on very limited trading pairs of cryptocurrencies. Most active exchanges — to be more exact, 251 of them — had terms of service that defined their operation and objectives. As Schwarz has argued in the case of Facebook, these terms-of-use documents not only describe the conditions of using platforms, but also replace the contractual terms with "quasi-constitutional governing documents" (2019, p. 132). I closely studied the top twenty exchanges' terms of service, interviewed a few of their writers, and skimmed through the rest. However, I carried out a computational text analysis of all 251 terms of service, carrying 99.99% of the cryptocurrency exchange volume in the world.[5]

5. To download the raw data of all of these terms-of-use documents and the R code, see Birbil & Caliskan (2020).

The paper opens with a microscopic look at the X Exchange, one of the largest platforms in the world. Here we see how its employees understand the world of this singular exchange. I discuss their priorities, the ways in which these exchange platforms understand the work they carry out, the worlds they occupy, and the actors they recognize. Following this microscopic approach, I step back and take a general look at the larger universe of exchanges globally, analyzing not only how these exchanges work, but also how their actors imagine a future of hyper-digitalized economies.[6]

2 Inside the X Exchange

Data money markets have been the most difficult markets to study for me. I have developed friendships and acquaintances in various trading circles over the last two decades, as I have studied commodity and sustainable energy markets; yet, it took nine months to be accepted into a cryptocurrency exchange building, so as to observe and interview its employees.

Teaching cryptocurrencies helped. A student had told me that he wanted to take my class because his best friend was "totally into Bitcoin." It turned out that his friend wanted to meet me and audit a lecture. Following his visit, we met over coffee, and I asked him whether I could visit the cryptocurrency exchange for which he worked. He reached out to his supervisor, who then reached out to her manager, who wrote to "compliance," and compliance sent me an email with a contract attached. After having been denied by thirteen exchanges, the fourteenth accepted me into its global headquarters following an arduous contractual process that took two months. I could not use the exchange name, or take photographs, and I had to be accompanied by a human relations (HR) representative during my fieldwork which had to be "short."

I had already started to learn about these exchanges before being admitted to one of them. I accepted, signed the agreement, and entered — at least, in theory and on paper. In order to actually enter the building, my picture was taken, twice — first downstairs at the reception, then just before entering the offices on the upper floors, where I had to sign another digital contract on a tablet. They were kind and friendly, accepting to give me a copy of the contracts that I had signed. To my surprise, as I wrote my fieldnotes at night, I figured out that these contracts did *not* have any clause about taking photographs. Needless to write, I had not had time to read them as I entered. They were more liberal than their signatories interpreted. It was the HR representative who had politely asked me to keep my cellular phone in my pocket, not the contract.

There were around 200 mostly young employees scattered across multiple floors. The exchange looked like an endless train of cubicles and did not have a particular look or interior design that could be identified as that of a cryptocurrency exchange. Perhaps the only detail that could remind someone of the office's identity was tangible: printed photographs of the logo of X-Coin (the pseudonym I use for the data money that X Exchange makes with the help of its private close-accounting blockchain).[7] Similar to many other technology companies in Silicon Valley in California, this one also offered free coffee, cookies, and lunch at almost all times. One quiet room was designated for "reading and research," with an expensive-looking armchair and a designer lamp next to it. In that room, there hung on the wall a reproduction of

6. This paper focuses on centralized data money markets. I exclude decentralized exchanges for two reasons: First, when I started my research in 2018, these exchanges were displaying a minuscule trading volume when compared to centralized exchanges. Second, their platform qualities, objectives, and offered services are limited when compared to centralized exchanges.

7. For an analysis and explanation of blockchain taxonomy and its evolution, see Caliskan (2020).

a Monet painting and no poster or sign of any cryptocurrency. One of my informants referred to it as "the empty room": "No one really goes there. Who would like to read at work?"

Unlike others who study data money communities, I did not meet anyone with dreams or utopias about blockchains, or the future, or anything else. The employees were quite unattached to their job, although "an excitement about Bitcoin" was referred to by a number of informants as the first reason for looking for a job in the data money sector. "We are running an exchange platform, just like any other market," a coder with an MBA said. When I questioned his "everything is the same" approach to the historical digitalization of everything and asked him whether there was no change at all, he drew two intersecting Venn diagrams on the yellow legal pad he was carrying with him, pointing at their intersection with his index finger, and said: "This is new." I saw many people carrying pads and notebooks, in addition to laptops and tablets, in their hands, as they walked around the enormous open office space of the exchange.

I had expected the exchange to be filled with computers from floor to ceiling and employees in very casual dress; yet, it was visually dominated by windows (tangible ones with glasses), desks, and human bodies, dressed mostly in formal business attire. Women, as well as people of color, were a significant minority. The computers, still many of them with multiple screens attached to single desktops, disappeared within this huge blue- and black-dominated hall that smelled of coffee, carpeting, and air-conditioning. As I continued to observe the place, I began to realize that it was like a locomotive pulling the entire operation globally. There were at least five other, smaller offices around the world, data centers in the US, Europe, and Asia. There were coders working all around the world, either in their offices or homes, from Mumbai to Sao Paulo; a digital security sub-contractor in Switzerland; and designers in London and New York City, who attached highly edited pictures and photographs to invisible codes for marketing purposes.

I completed my research in March 2020, just before COVID-19 brought human bodies to a standstill, re-distributing this globally already scattered business operation. I continued to interact with the people I had met in the exchange during the pandemic. Our conversations centered around the notion of money. For many of them, a cryptocurrency was "digital cash," "electronic money," "money that lives in a computer," "a store of value with no central authority." Yet, when I asked about the nature of the data money that their exchange was making, many accepted that it was legally centralized and drawing on traditional double-entry bookkeeping. One accountant in charge of blockchain accounting defined the money they were offering as a "common language to describe value":

> – What do you mean by language and value, what is in a cryptocurrency?
> – It's like all other values. A social agreement. Not very different from other monies. We make this one with data. But blockchain does the accounting.
> – But your money is accounted differently, in your own books.
> – Yes, if you want to withdraw your Bitcoin, then we register it on Bitcoin blockchain. If you keep it here, it is technically ours.
> – So, you have a twin accounting system.
> – Correct... We are not a money market only. We're a platform. Here, we make money to exchange it. In the real world, monies are made to buy things. We make cryptocurrencies to make money.

His point about accounting has been the case with almost all data money exchange platforms. When one buys a Bitcoin and keeps it in their books, one does not "get" it. To "with-

draw" it, as exchanges call it with a banking term, one needs to pay a fee, another source of income for these platforms. These platforms are not mere marketization places, as the informant above summarizes. They are places of making monies, accounting systems, services, and many other economization practices.

> – But fiat monies are bought and sold for making money too. How is yours different?
> – Yes, then we're not very different either, I guess.

They were different and, at the same time, not different. For the vice-president of the company, cryptocurrency is the only money that "people can control. Dollars and Euros are controlled by states and the rich. Bitcoin does not need a central agency."

> – You run a centralized exchange here, don't you?
> – But we don't make Bitcoin, we operate a platform. It brings sellers and buyers together. We help people trade monies.
> – But the only way to get a Bitcoin without buying it is mining, now only open to rich investors. Where is the people here?
> – They are here in our platform. They can buy it here. They don't have to mine it if they don't have money to invest in mining.

Such a shift from "people" to "platform" emerged frequently during my interviews. The conversation would start with the terms "trustless," "no intermediary," "stateless," and "decentralized," and end by accepting the explosion of new intermediaries, the exchanges' requirements to report crypto assets to the states, and the institutional linking of fiat currencies and data monies.

One informant compared oil and Bitcoin to explain what they do in X:

> Oil is money too. It runs through pipes. When there is an accident, it spills. Our money runs through cables, is stored and secured. In reality, it is a piece of data. You send it, you receive it. It's unique, can't be double-spent or replicated. One may think it's the same gas wherever you buy it from. It's not. I fill my car's tank from, say, Shell, but not from a gas station with a strange name. I trust Shell oil. It's the same. People trust us in buying their Bitcoin, Ether has gas, too, you know (he laughs). You buy your Bitcoin from us, you sleep well at night. It's our Bitcoin, not *a* Bitcoin. That's why you pay us money to keep it here."[8]

This self-description draws on two important conclusions. Unlike many, he was not employing digital/material rupture talk, instead alluding to the digimaterial infrastructure that cryptocurrency exchanges build and on which they operate. Second, he made visible the relationship between platforms and markets. In markets, one is more concerned about the quality of the product; by contrast, on a platform, one is concerned about the quality of the platform from which one buys the product or services. Buyers choose platforms first, then comes the product. What is different is not data money, but the platform that moves, keeps, and trades it.

8. For an interesting comparison of oil and data, see Couldry & Mejias (2018).

> – Why should I choose your platform, but not the other?
> – If you want to withdraw your Bitcoin or Ether, you get it faster from us because we pay more transaction fees compared to others. We're safe. Providing you with vault services, cold wallets etc. If you want to trade in volumes larger then you have, we lend you crypto money. It is not just a market. It is a whole world here.
> – What other things are done in this whole world?
> – We have teams for everything. Product development, project management, software development, quality, insurance, infrastructure, customer support, compliance, research, admin, office maintenance, cyber-security, arbitration, outside counsels, tens of third-party vendors, design, HR, you know, like a regular company.

This "whole world" was indeed like a regular company making and maintaining an exchange platform bringing together buyers and sellers. In all marketization relations, we observe five main practices, all of which can be located in the market side of data money exchanges: (1) pacifying goods, (2) marketizing agencies, (3) exchange encounter design, (4) price realization, and (5) managing trade politics (Caliskan & Callon, 2010, p. 5): In X Exchange, too, the employees control the overflows of the materiality of their exchange objects (pacifying); they build institutional capacity to facilitate trade (marketizing agencement); they design the modalities of encounter (encounter design); they craft various forms of price making, setting, and pricing prostheses production (price realization); and finally they manage the everyday politics of trade by a variety of instruments (trading politics). However, the expression "the whole world" refers to the fact that X Exchange goes beyond marketization and introduces a new series of economization practices that we do not see in non-platform marketization. Furthermore, these practices were only a part of the general infrastructure on which the exchange was drawing. Since the entire system is data-dependent, it had to be based on a chain of data centers. When I asked about where these were located, the human resources representative interrupted me: I was not allowed to ask this question due to its sensitive nature. As I got ready to question its sensitivity, my informant said that the locations of the data centers were common knowledge, as they were posted on their website.

There is, of course, an entire universe of exchange platforms, many of them with an even higher trading volume and with more markets than X Exchange. To include them in the picture, we need to enlarge the scope of our analysis to take a general look at their operations and the relations they manage.

3 Global Data Money Markets

When it emerged in 2008, Bitcoin was worthless in terms of USD and remained so until March 2010, in part as result of the absence of an intermediary to exchange it. In 2010, the first data money exchange market, the now defunct bitcoinmarket.com emerged. The value of Bitcoin began to pick up. It would exceed 41,404 USD in a decade.

The emergence of Ethereum in 2018 marked the second turning point for data money markets in the world. As of 2019, 88% of top 100 cryptocurrencies in terms of market cap were Ethereum-based (Caliskan, 2020). Proving to be a big bang for cryptocurrencies, Ethereum had a structural impact on market emergence. Of the 339 exchanges in the world, half emerged after Ethereum. The year 2018 also marked a jump in market expansion since 36% of all data money markets emerged in that year alone.

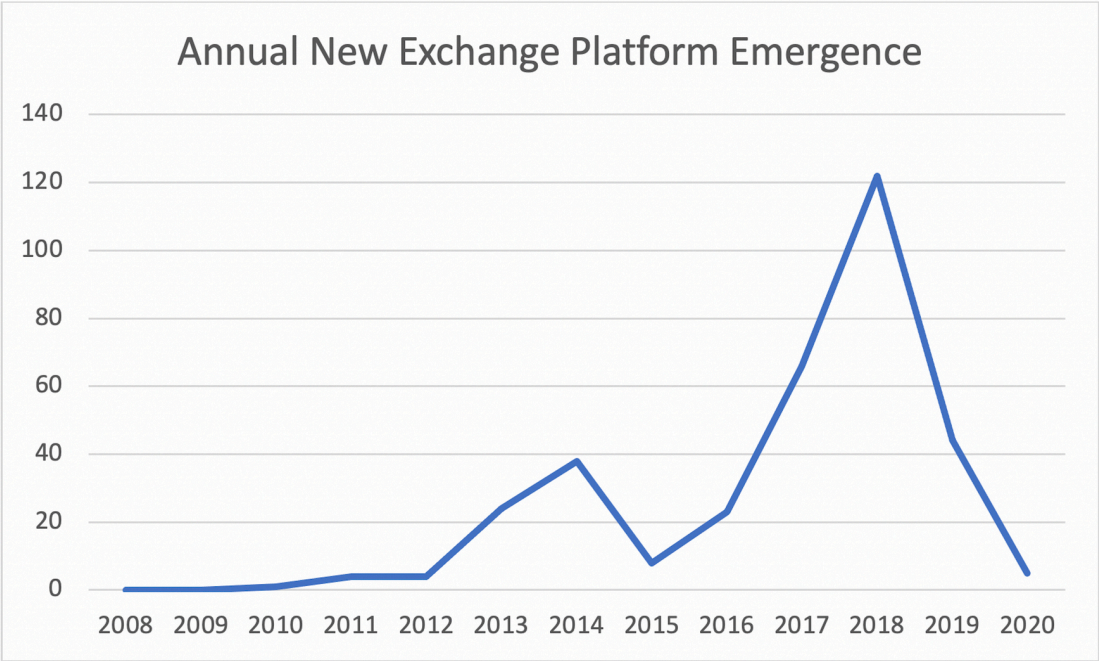

Figure 1: Frequency of New Exchanges Emerging Annually[9]

Where are these markets located? Singapore (36), UK (25), South Korea (21), Estonia (17), Hong Kong (17), USA (15), and Turkey (12) host 57% of the data money exchanges I focus in this paper. The geographical location of these markets is important for legal reasons. Yet, the geographical place of where the *components* of these platforms operate is an entirely different question. As we have seen above, X exchange drew on a multiplicity of locations in the world to maintain its platform. The legal place is only one of the locations in the socio-digital geographies of platform production and maintenance. Furthermore, once one enters the platform, the "place" of interaction occurs at another level in stack economization. This is why it would be insufficient to approach these markets from the vantage point of space only; unlike many conventional exchanges, they show little pride in their physical buildings and even make a conscious effort to hide the offices where they are located.

Traders often use their material physical space to describe how their markets work, usually by employing a narrative that belongs to Adam Smith, rather than their own.[10] They would also take visitors around the building they inhabit, inviting visitors or researchers to associate their trade with the place where it happens. I believe that, in part, this is the reason behind the problematic equation of the marketization process with the material infrastructures that facilitate it. In X (or any of the other 338 exchanges), there is no pit, no center, no building, in many, not even a headquarter, where one can see the moment of buying and selling. The employees of the exchange call their place a platform.

It is practically impossible to carry out conventional fieldwork in all of these platform exchanges and the larger universe that they create, because studying derived geographies such as the "global" is only possible by conducting research on their processes of derivation, an ap-

9. 2020 data represent the frequency through October 10, 2020.

10. For a discussion of how regional and local traders describe their marketization processes, see Caliskan (2011).

proach I have used to study the making of global commodity markets and their prices (Caliskan, 2009; 2011).[11] With the help of computational text analysis, however, we can take a bird's-eye view of these thousands of markets, by focusing on the terms of service that describe and analyze the world they create with their own words.

These cryptocurrency platforms, frequently presenting themselves as trustless systems, require their users to sign these terms of service contracts to give access in the first place. Our age seems to take Durkheim's observation on the non-contractual basis of contracts one step further: Platform works stand on the contractual basis of trustless systems.

Referred to as "terms of service," "terms of use," "terms and conditions," or simply "terms," a long contract is required to be signed by the users of all data money exchanges. There exists no exchange with a substantive trading volume that at the same time does not impose a terms of service contract on its users. Of the 339 exchanges operating more than 22,707 markets as of 7 July 2020, 251 exchanges, representing 99.99% of all world trade in data monies, require users to sign a contract.

The 251 exchange platforms on which I focus in this paper operate thousands of markets, based on trading one pair of data vs paper money exchange. In other words, if a client buys 1 Bitcoin from X Exchange by wiring them Euros from their bank account, they are active in one market — that is, the BTC-EURO market — only located in X Exchange. A client can "shop" for other exchanges, for there are at least 250 more exchanges with a BTC-EURO market active 24/7.

As of 7 July 2020, these exchanges traded 5,695 data monies. Bringing together all terms of service for computational analysis produces a single document with almost 1.5 million words that would fit onto 3,232 US legal size pages. On average, a cryptocurrency exchange contract contains 5,754 words, or around half of the length of this article.

A close reading of the terms of use of the top-twenty exchanges of which X Exchange is a part,[12] and a computational text analysis of all 251 platforms opens a limited yet general window in their workings. All top-twenty exchanges define themselves as a "platform," but use also other terms such as "marketplace," "exchange platform," "a world," and "ecosystem." The top exchange in our list states:

> Binance refers to an ecosystem comprising Binance websites (whose domain names include but are not limited to https://www.binance.com), mobile applications, clients, applets and other applications that are developed to offer Binance Services, and includes independently-operated platforms, websites and clients within the ecosystem (e.g. Binance's Open Platform, Binance Launchpad, Binance Labs, Binance Charity, Binance DEX, Binance X, JEX, Trust Wallet, and fiat gateways). In case of any inconsistency between relevant terms of use of the above platforms and the contents of these Terms, the respective applicable terms of such platforms shall prevail (Binance, 2020, p. 1).

"Binance" claims to be above a multiple-platform operation, seeing itself above platforms, or an "ecosystem" made up of websites. Yet, for the purposes of this legal contract, the ecosys-

11. For derivatives and derivation, see Guyer (2004); Lépinay (2011).

12. The top-twenty exchanges in terms of monthly trading volume are the following: (from the largest to the smallest as of July 7, 2020): Binance, Coinbase, Upbit, Bitstamp, Gate.io, Bitfinex, Liquid, Kraken, Poloniex, Bitflyer, Bithumb, Coinone, Bittrex, Gemini, Bitso, Paribu, Zaif, BTC Markets, Indodax, and ItBit. On the same date, these exchanges carried around 9% of all cryptocurrency exchange platform trading in the world.

tem itself is seen as one big platform that provides clients with services and presents a market as only one element.

Following the main definitions, many of these exchange platforms ask the user's residence and locate themselves in the national jurisdiction of that particular user, accepting thus nation-states' boundaries to define their operations, even for free accounts:

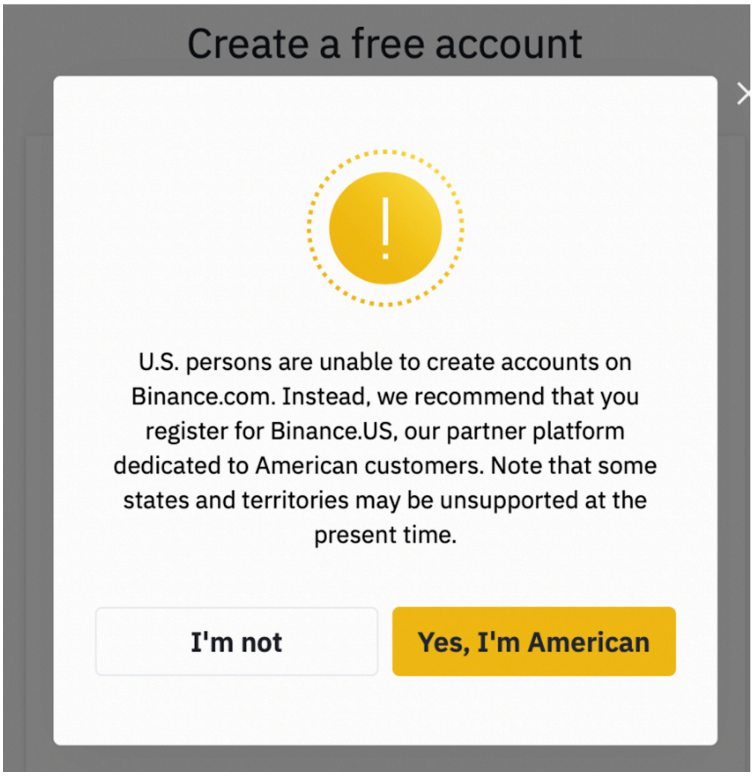

Figure 2: A Cryptocurrency Exchange Platform's Locating of Geography

The agency is as important as the place. These exchanges require the user of their services to be humans or limited liability companies hiring humans to trade on their behalf. Bots, spiders, automatic devices, algorithms, or digital-manual instruments meant to trade in or bypass platform infrastructure are not allowed.

Once users are accepted onto the platform, they can choose any of the services offered in these hundreds of exchanges. Buying and selling of data monies for fiat currencies take the central place in these exchanges which maintain completely digitalized order books. Matching buy and sell orders according to a chosen algorithm, exchanges facilitate trade much like any other commodity exchange. Unlike cotton or barley, however, the "technical quality" of the data money bought is universally the same, although the security of holding on to it and keeping it changes from platform to platform (MacKenzie, 2019). As my informant from X Exchange said, their Bitcoin was "different" because they were different.

Similar to commodity exchanges that operate on warehouse receipts, crypto-exchanges also operate on transferring the ownership of data monies by using digital representations of their ownership, instead of transferring the data money itself. If a client buys cotton, no one necessarily ships cotton to the place where the client will open its bales. Rather, the client owns the receipt that represents the commodity. In crypto-exchange trading, when a client buys 1 Bitcoin, the exchange registers that data money on the client's internal account and does not

register it as that of the particular client on the Bitcoin Blockchain. It remains as a custodial asset within the exchange, and the exchange uses it for its own trading and money market considerations. If a client wants to get a hold of it and sell it in another exchange, then the client will have to "withdraw" it from where the client buys it and pays a withdrawal fee, a substantial amount if this operation is repeated often. Depending on the exchange, it is not uncommon having to wait for a few days before the client can see it registered under their name. Platforms prefer to keep data monies in their secure data centers that are not connected to the internet, and can use them whenever they want. As long as they have a hold of these data monies, stack economization on their platforms can be richer and more lucrative in terms of fees or prices for their services.

There are five types of fees in data money exchanges: the spot transaction fee, interest rate, futures transaction fee, deposit fee (which is usually zero), and the withdrawal fee. Whenever a client moves data monies, the platform charges fees for moving data from one place to another. The more users move data, the more money and services move, and the more money the platform makes. Users belong to various types. In most of these platforms there is a minimum amount of data money one should keep, always represented in terms of fiat currency such as USD and Euros. The fees decrease as the account size increases. If a user chooses to buy a lump sum of data money, the price is negotiated outside the platform, and the data monies they buy are handled away from the order books, unless the buyer and seller decide otherwise. Someone buying 2 million USD worth of Bitcoin would not buy it from X Exchange webpage. The owners of X would arrange a special deal over the counter.

In addition to fees, exchanges will also impose an interest rate, if a user chooses to borrow data money to trade it. There are two forms of borrowing: The first consists of an authorization to trade on margins, for example, ten times the user's account balance, as long as their position remains within a range defined by the exchange. Margin trading draws on data monies borrowed from a cryptocurrency exchange and assetizing them by means of a loan that is extended to the user from the same exchange, replicating any other margin trading practice in non-crypto markets. The amount one can lose in these margin trades cannot exceed the original data money one keeps as a custodial asset. The second way of borrowing is similar to contemporary banking, with an interest rate, but this time imposed as a percentage of the data money one borrows. This emergent form of borrowing, without a systemized and legal framework, may entail multiple data monies, including the one that the exchange itself produces.

Almost all exchanges either issue their own monies or have plans to do so. X Exchange's X Coin is not a successful data money. It is worth almost nothing in comparison to Bitcoin or USD, and it is not used by third parties. But there are many other successful data monies minted by cryptocurrency exchanges, usually carrying the name of the exchange whence they originate, such as Binance Coin, trading for around 41 USD as of January 2021. Issued on the Ethereum blockchain, Binance Coin enjoys special consideration on the Binance platform. If a client uses Binance Coin for their transactions, they pay less in fees when compared to holding on to other data monies. Platforms offer special treatment not only to customers with a higher balance, but also to users who draw on the host platform's data monies, thus incentivizing the use of their own currencies. Those incentives, fees, gift tokens, other payment vehicles, and the above-mentioned services are all defined and explained in the rich world of the terms of service.

A computational text analysis of terms of services shows that the most frequently used words fall into three frequency categories: The first category with terms that are used more than 8,500 times are "user," "services," "account," and "information." It should not be surprising to see such a distribution, because these documents define the "users" of platforms and

receive their "information" to hold them "accountable" for the "services" that these exchanges monetize. The second group of frequencies, clustered around 4,500-8,500 instances, help us better understand the focus of these exchange platforms. These terms are "digital," "company," "agreement," "website," "platform," "service," "transaction," and "terms," ordered from the least to the most cited within that range.[13] This string of terms can even be read as a full sentence in itself. In a close reading of these texts, one sees very clearly how these "digital companies" ask their users for their "agreement" to log in a "website" for "platform services" that entail "transactions."

It is important to note that these "digital" companies do not shift all economic activity from material to digital; rather, they hybridize economization relations by rematerializing and digitizing. Empirically speaking, data money platforms draw on rematerialized spaces of encounter and do not operate along a material/digital divide. Successful economic stacking in part relies on this dynamic hybridity. There exist two kinds of materiality that are deployed in cryptocurrency exchanges. The first type is a *tangible materiality* associated with infrastructure works and networks of machines, such as cables, signal systems, antennas, and computer hardware.[14] *Intangible materialities* draw on observable orders. These orders are produced and maintained, in part or entirely, by representational tools such as data or algorithms produce.[15] The terms of service I analyzed give much space to imagining and constructing a space to mobilize a process of entanglement and disentanglement between rights, data, and money. Monetizing the right to send data depends on such simultaneous deployment of tangible and intangible materialities as representational orders.

Such representational orders are built with an invisible consequence in mind. As these platforms operate on a derivative representational order, they *undermine* open accounting public blockchains such as that of Bitcoin. Instead of registering transfer of ownership of data monies on blockchains, these exchanges mobilize an in-house accounting system to keep track of ownership rights. They register data monies under a user's name only if a particular user decides to "withdraw" her assets from the exchange.

13. I chose not to count "services" and "service" together, because when used plural, it meant the general economic functions, yet when used singular it alluded to the specific nature of economic function in focus. Yet even if they were stemmed, the result of the analysis would not display a categorical change.

14. For an analysis of these materialities and their agency in socio-economic relations, see MacKenzie, 2009.

15. For a discussion of data as representation and the materialities associated with these data, see Dourish (2017).

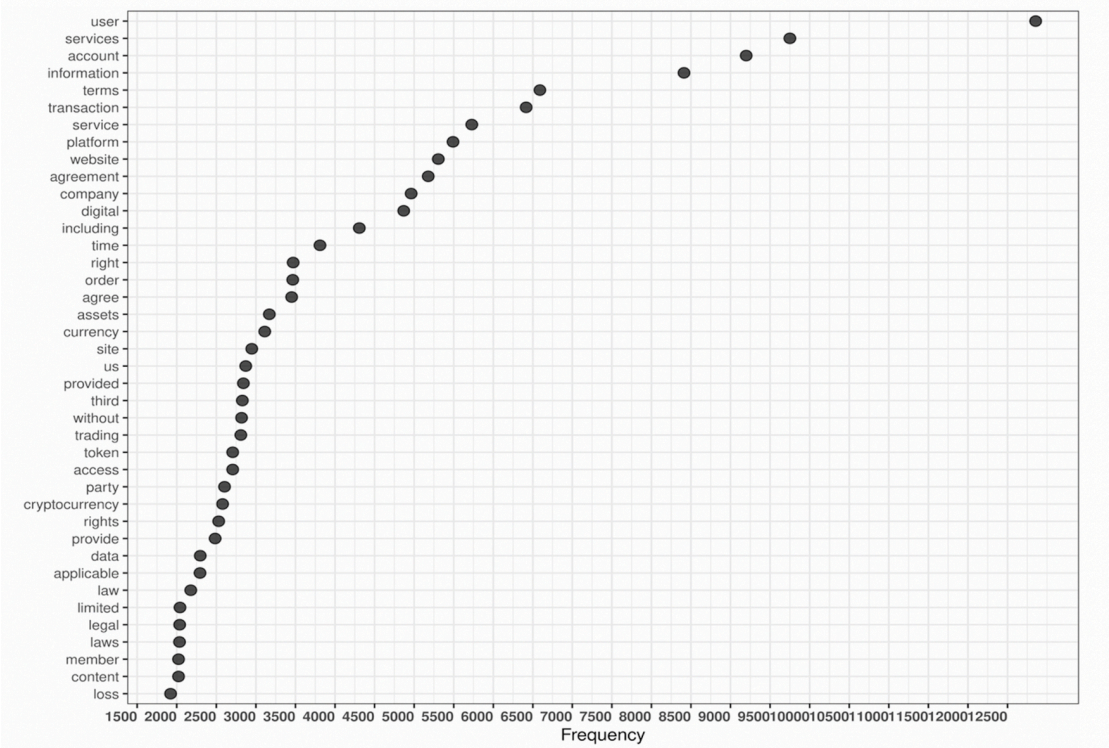

Figure 3: Frequency of Words Used in Terms of Service Agreements

Centralized data money exchanges serve as vehicles of dollarization and conventional accounting for two reasons: First, the USD has become the main asset in representing the comparative value of cryptocurrencies, thus opening new economic avenues for the USD to be deployed in trading. Second, by bypassing blockchains as distributed accounting systems and using exchanges' own double-entry centralized and private book-keeping, data money markets contribute to the undermining of open accounting and public blockchains like that of Bitcoin. As visible in Figure 4, which is based on the platform registered vs blockchain-network-registered Bitcoin trades between 23 January 2018 and 22 January 2019, the percentage of Bitcoin transactions that is registered in the Bitcoin Blockchain is declining. In the near future, it may become negligible, making blockchains a simple tool of final confirmation in trading data monies, instead of being *the* main institution of their distributed accounting.

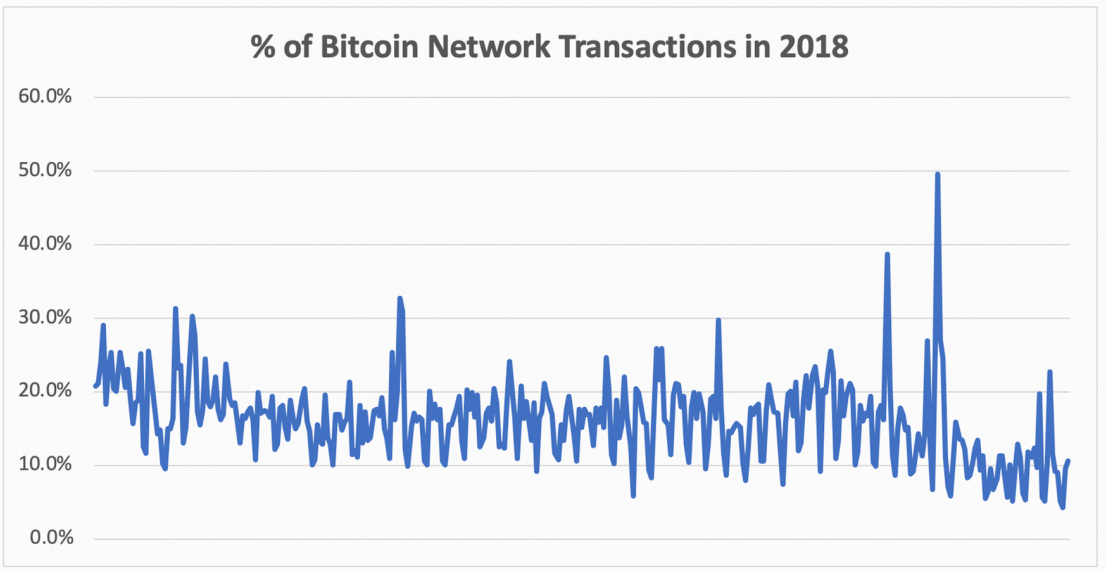

Figure 4: Data Money Markets undermining of Blockchains[16]

The unsupervised frequencies of the terms within the terms of service documents show much, even though they have a double limit. First, one encounters an obvious list of terms. It should not be surprising to see "account," "service," "rights," or "users" as the most frequently occurring terms. Second, these unsupervised frequencies do not give us a chance to control for a specific perspective in approaching the data. We can address this challenge by deploying a social science dictionary as a lens to approach the same data, by counting the appearance of social scientific concepts that are used in terms of service agreements. With 1,800 entries supported by a comprehensive bibliography, Calhoun's is the most helpful dictionary in three ways (Calhoun, 2002). It is a popular dictionary that represents the attention of social science students and researchers. Second, the dictionary is supported by a robust bibliographical study. Finally, moving beyond disciplinary considerations, its intended transdisciplinary focus makes it possible for researchers to control for the social scientific attention that these terms of service pay to imagining and regulating the world they inhabit.[17]

16. The source for total Bitcoin trading volume in centralized exchanges is http://www.CoinMarketCap.com, whereas the network registered daily volume data source is https://www.blockchain.com/charts/estimated-transaction-volume-usd. The two sets were calculated to match USD equivalence of BTC in each day's 24-hour trading price average. CoinMarketCap data were downloaded after their filtering out of possible wash-trading practices from their data sets.

17. Core social scientific categories are stemmed to represent the terms of service documents' foci. For example, finance and financial were plotted together. Note that "i.d." in the dictionary is a Freudian concept, not the identification number in terms of service documents. Finally, "representation" in terms of service documents refers to the legal status of acting in the name of another legal person, thus bearing a more limited meaning than it is used in the social sciences.

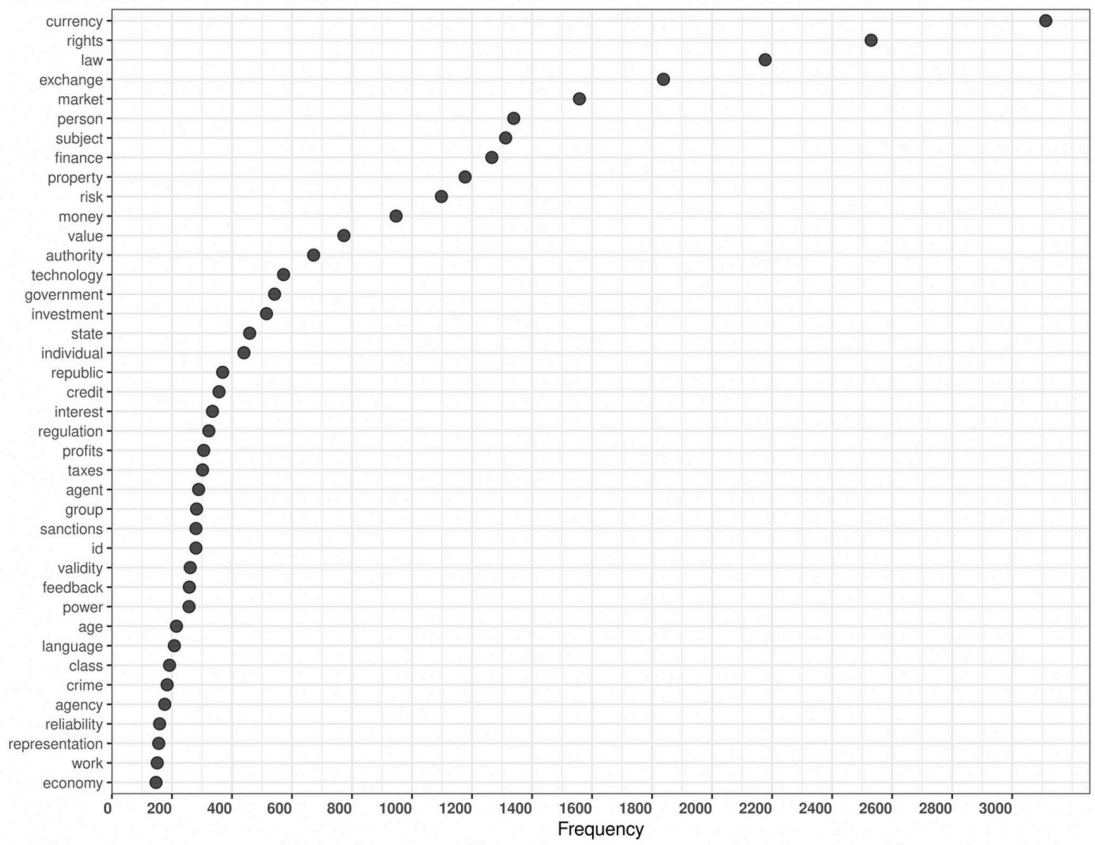

Figure 5: Frequency of Social Science Concepts in Terms of Service Agreements

Similar to the unsupervised analysis of general terms, social scientific concepts are also clustered around three groups. The most frequently used terms are "currency," "rights," "law," "exchange," and "market." Used between 1,500 and 3,200 times, these concepts sit at the center of the social scientific concepts that these exchanges deploy to describe themselves and to govern the economic world they inhabit. The obvious frequency of these words, which pop up on virtually every page of these documents, attests to the fact that data monies are marketized by exchanging the right to send data among users, by drawing on exchange as the framework for organizing these relations.

What is more telling in this cluster is the absence of the two essential terms in relation to which these exchanges emerge in the first place. A comparison between Figures 3 and 5 makes this absence visible. "Platform," the central concept basically referring to everything that happens in a data money exchange, does not occur even as the least frequent term in Figure 5, for it does not exist in one of the most popular social science dictionaries. If it were there, with a usage of 5,750, it would be *the* most frequently used term, almost ten times more than "blockchain" (538 times), the second crucial term that also lacks an entry in the social science dictionary.

In these terms of service, "platform" refers to the place where every exchange activity takes place. "Ecosystem" (330 times) is also used, but usually in preambles, and never as a legal term that these exchange platforms deploy to regulate their relations with users. "Place," "website," "webpage," and "marketplace" are also used to refer to the place of exchange activities, yet less frequently, without legal entanglement, and as colloquially as these texts allow in their bodies. It is safe to argue that "platform" is the term that these exchanges use to describe, show,

and regulate their economic activities. However, much like in the context of other exchanges around the world, it would be erroneous and incomplete to either equate economization with the place where it occurs, or to accept how market architects describe themselves as *the* main description of exchange practices. This is because these descriptions are, among other things, simultaneous investments in making more money in these exchanges.

As is empirically clear now, platforms go beyond being mere markets that bring together supply and demand. This is not because markets cannot be defined only in reference to supply and demand, as a massive and heterodox literature has already shown, but because platforms make possible and harbor economic practices that go beyond marketization, such as money-making (Binance Coin, X Coin), infrastructure development (markets built within markets), banking (loan and interest rate servicing), accounting (double-entry book-keeping and blockchain), barter (among various data monies), gifting (issuing gift data monies for new users), and many other and intersecting modalities of economization that are all stacked and deployed together on a platform.

I argue that Stack Economization describes the dynamism and multiplicity of economic practices that take place on platforms better than any other available concept. It refers to the stacked nature of the multiplicity of economization practices that either draw on or make possible each other as architectures or infrastructures. The exchange (Binance) is infrastructural to a specific market (ETH-USD), which is infrastructural to futures in ETH, whose trading makes possible margin trading. Furthermore, depending on the user, the ground of activity can be an architecture or an infrastructure.

Stack Economization does not *explain* how a data money exchange platform works. It defines platforms to theoretically prepare a ground to understand, register, and analyze the multiplicity of their specific economization processes. Seeing platforms as two- or multi-sided markets (Rochet & Tirole, 2003), or technologies (Evans & Schmalensee, 2005), or mega-infrastructural places (Bratton, 2015) fails to account for the dynamism and multiplicity of these economization practices.[18] These approaches choose to describe platforms based on the tools they use (technological devices), the limited practices that they mobilize (trade), or the place where they are located (the Stack) and imagine an objective systemic unity in what they call "the platform." Platform is neither a place, nor a bounded object. It is an economization process.

Looking at terms of service of data money markets from the perspective of social science dictionary also makes visible how platform-makers control overflows. The second group of concepts, used between 400 and 1,500 times in these documents, are "person," "subject," "finance," "property," "risk," "money," "value," and "authority." These terms create a legal opportunity structure to govern data monies' transfer and valuation by controlling the risks associated with financial volatility and fraud. Non-humans, except for registered limited liability companies, and unauthorized algorithms are not permitted to be actors on these platforms. Without being a human subject, one cannot use these socio-digital platforms.

4 Conclusion

Despite the frequency of studies concerning cryptocurrency markets and data money prices, there exists only scant literature on how these markets work on the ground. There has been

18. For a fruitful discussion of how the literature sees platforms as markets, infrastructures, and ecosystems, see Grabher & König (2020).

a tendency to bypass fieldwork in exchanges by drawing on anecdotal experience or the theoretical premises of the very empirical developments under study. This propensity has been criticized for its acceptance of the plans and motivations of actors as practices, not beginning with empirical observation of how actors mobilize economization practices in the first place (Garrod, 2019; Jones, 2018). This paper has addressed this gap in that it has empirically analyzed global cryptocurrency markets and exchange platforms simultaneously from within and above, by pursuing a two-tiered research strategy.

The first tier rests on ethnographic research at X Exchange and presents an introductory analysis of how a data money exchange platform works from within. I have described how exchange actors see what they do in their everyday practice. These "transparent" places that mobilize "trustless" systems had weak trust towards scientists, as I was asked to sign a multiplicity of legal documents, had my movements monitored, was not permitted to photograph the offices, and had to have HR experts accompany me during my research. Still, one also has to consider that X Exchange has been one of the most respected exchanges in the world, never having been associated with wash-trading or illegitimate economic practices. This very exchange is now helping to set the data money trading standards in the world.

A detailed look into the workings of X Exchange has shown us that market actors do not operate along a digital/material divide. For them, data have a materiality that is distributed among tangible and intangible properties. Their job is to build new architectures by using or drawing on these materialities. Data money making counts among these practices. Describing the everyday practices in a data money exchange, the paper's ethnographical attendance has rendered visible the actors' own understanding of the exchange. This discussion has illustrated how exchanges go beyond marketization relations and constitute, as one X Exchange actor called it, "a whole world."

Enlarging the scope of analysis to include all other data money markets has required giving up the analytical power of ethnography and interviews, and to employ a computational analysis with a wider scope in order to take a brief look into their "whole world." The first precondition to enter these economic places is to sign a legal document that frames the way in which exchanges see and describe what they do: terms of service agreements. This paper has focused on 251 exchanges by analyzing, among other things, their terms of service. A two-step computational text analysis of these documents' corpus has facilitated a consideration of their priorities and definitions. As a first step, I have looked at the unsupervised frequencies of all terms, whereas the second step has employed a social scientific lens so as to discover which social scientific concepts are used the most.

First, terms of service texts describe their exchanges as "platform," one of the most frequently used words in the unsupervised frequency analysis (Figure 3), although completely absent in the dictionary analysis (Figure 5). This is, in part, because the social sciences are still working on making visible and understanding platforms. If "platform" were considered a social scientific concept in that particular dictionary, it would be by far *the* most frequently used social scientific concept in Figure 5. These exchanges see themselves as platforms that present a variety of products and services to their users, such as futures and spot trading, decentralized market entry, vaulting, banking, infrastructuring, data gathering and interpreting, security provisioning, non-blockchain accounting, and so on. The multiplicity of these platform economic practices marks a historically specific and empirically observable economization modality, which I call Stack Economization.

As part of a design challenge to visualize platform economization in cryptocurrency exchanges, I worked with two designers, Lauren Stobierski and Stephen Johnson. Reading this

paper and discussing with me how cryptocurrency platforms work, they designed Figure 6, visualizing the dynamism and multiplicity of economic practices that take place at X Exchange. In this figure, we can see how platform economic practices entail a variation of economization practices. Such multi-functionality is constructed as a result of the material opportunities that gave birth to the possibility of stacking economic relations in the socio-digital universe of data things. On such platforms with multi-layered market infrastructure, one can use a bank to borrow money to trade, receive and give gifts, buy Ethereum with USD, barter Bitcoin with X Coin, shop for security services, subscribe to a trading algorithm, and use their arbitration services. Furthermore, they are all instituted on platform infrastructure that connect all these modes of economization with data streams that are further economized by whoever controls the platform. This visualization not only captures the modular and multi-functional nature of a cryptocurrency platform that goes beyond being a mere multi-sided market, device or infrastructural geography, but also shows how various parts work with and relate to each other.

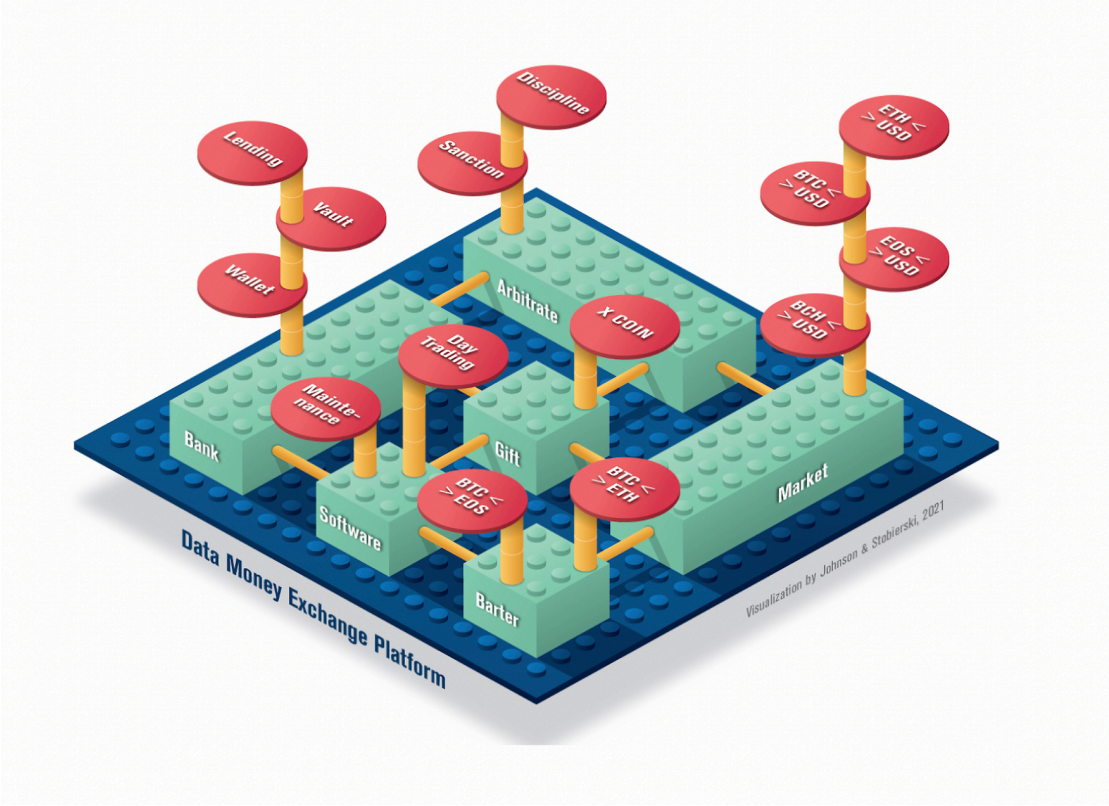

Figure 6: Visualization of Stack Economization in a Cryptocurrency Exchange Platform

One may argue that platforms can still be seen as mere two-sided markets, for it is true that markets are never just "markets:" Conventional organized exchanges, such as spot and derivative markets, also entail a multiplicity of functions, yet we still call them markets. However, their multi-functionality remains within marketization limits and never constitutes separate domains of practice that encircle the commodity exchange itself. On platforms, such as data money exchanges, we observe a *categorical* multiplication of economization modes and their deployment, not a mere variation of marketization. In the entire world, there exists no commodity market with its own mint.

A strand of research has been describing platforms as a new kind of market. For Rochet

and Tirole, platforms are two-sided markets that negotiate network externalities in specific ways. For others, the platform is a multisided *framework* (Gawer, 2009), a *technology* of matchmaking intermediation (Dijck et al., 2018; Evans & Schmalensee, 2005), a coordination *device* facilitating trades with certain new economic effects (Ambrus & Argenziano, 2004), or a new *infrastructural* business *model* (Srnicek & De Sutter, 2017). For yet another group of scholars, the platform draws on the use of data, algorithms, and computing as new tools of production (Wark, 2019), or as a new capitalist accumulation form centered on data extraction (Zuboff, 2015). And finally, the platform is a system, an economic system, an ecosystem that qualifies, basically, everything happening in it (Jacobides et al., 2018). In many other approaches, platforms are discussed simultaneously as markets, ecosystems, and infrastructures with intersectional functionalities (Kapoor, 2018; Shipilov & Gawer, 2020), or a reprogrammable system: "If you can program it, then it's a platform. If you can't, then it's not" (Andreessen, 2007, quoted in Bogost & Monfort, 2009, p. 4).

My empirical research on data money markets has shown that the actors who use, make, and maintain these exchanges describe them as platforms that incorporate technologies of intermediation in a digital-material space, which they call platform, market, or ecosystem. Most of the above social scientific approaches are accurate in using the concepts also used by economic actors to describe platform universes. However, considering platforms *only* as markets, technologies, systems, devices, infrastructures, frameworks or places would not represent the ways in which actors mobilize, carry out, and maintain platform works in data money exchanges. If studied as stack economization processes, however, the geography, devices, performativities, practices, agencies and technologies of platforms can be studied thoroughly and in relation to each other. As this empirical study has demonstrated, platforms go beyond marketization practices and can be seen as stacked economization processes. One should be careful, however, not to confuse conceptualization with explanation and analysis. Stack Economization is a concept we can use to explain the workings and maintenance of platforms. It cannot be used to stand in for analysis. In other words, we need to better understand the stacked nature of economization in platforms, not describe the platform with yet another concept, for a platform is a platform. Actors call it thus.

This paper has avoided identifying the process of stack economization with the geography it makes and takes place. Places of interaction have an infrastructural effect on economization relations of which they are a part, but they cannot replace their very description. A home is not a mere house. The findings of the paper do not support a conclusion that data money markets are either a part of the stack-like systemic formation or contribute to its unfolding. Theoretically speaking, imagining static objects (such as the economy, the nation, the stack, and the social) seems to do a disservice to a relational description of dynamic processes such as marketization and economization. Furthermore, this paper has indicated that what is being stacked in data money exchanges is not *the place* of encounter, but *a process* of economization.

Approaching platforms as stack economization processes has two advantages. First. it makes it possible to isolate layers of economic interaction in their enframed platform universe. By this way, we can study the making and deployment of platforms' technical operations by focusing on their infrastructure, performativities, agencies and devices, instead of focusing on one as *the* factor and then discuss platforms with reference to it. Platforms, as shown in this paper, are not mere markets of buying this and selling that, with network effects in an ecosystem. By approaching platforms as stack economization, we can isolate the consequences of these "network" effects. We cannot carry out such an analysis by imagining an externally appropriated *endogenous* effect, but by focusing on concrete practices that can undermine economiza-

tion practices *exogenous* to the platform under consideration. For example, here I have shown that an endogenous development that fosters cryptocurrency usage in centralized data money markets has been undermining blockchains themselves, while at the same time contributing to the dollarization of economic relations.

Second, approaching platforms as stack economization processes may inform a more nuanced research agenda that can isolate specific threads and functions of platform works and study their consequences. Such a perspective has the potential to inform social policy more effectively. For example, centralized data money platforms that allow for data money to fiat currency trading are introducing decentralized data money platforms which can be bridged in one platform. Thus, these platforms are advancing the stacking of economization in order to give actors tools to avoid public accounting systems, by punching holes in taxation and money transfer considerations. This development calls for serious and urgent questions about accountability and legitimacy. Referring to the mutually supporting and enabling platform-based exchange, production, barter and representation processes that are qualified by their makers and observers as economic, Stack Economization also helps us to imagine more effective economic policy and intervention tools for platform economies.

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Homines Diversi: Heterogeneous Earner Behaviors in the Platform Economy

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Abstract

The platform economy has entered its second decade, and researchers are developing new theorizations of it as an economic form. One important feature is a heterogeneous labor force with respect to hours of work. In this paper, we identify another type of heterogeneity, which is the diversity of economic orientation of earners. Using in-depth interview data from 102 earners on three platforms (Airbnb, TaskRabbit, and StocksyUnited) we find that even within individual platforms, earners have different behavioral models. We have identified three — the maximizing *homo economicus*; sociologists' relational *homo socialis*; and *homo instrumentalis*. We present evidence of these three types. We then discuss platform policies and how earner diversity aligns with their imperatives for growth.

Keywords: Airbnb; behavioral models; platform cooperative; gig economy; platform economy.

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1 Introduction

The platform economy has now entered its second decade, and researchers have investigated a wide range of platform outcomes, including inequality, trust, and racial discrimination (for a review see Schor & Vallas, 2021). There are also many studies of workers' experiences, particularly on lower-paid apps such as ride-hail, shopping, and delivery (Ravenelle, 2019; Griesbach et al., 2019; Robinson, 2017; Cameron, 2018; Ladegaard et al., 2018). These accounts have tended to describe a common platform experience, typically that of highly committed workers. Schor et al. (2020a) have argued that the literature has not sufficiently addressed how unique features of the platform model — low barriers to entry, choice of hours, and the ease of working for multiple platforms at once — produce a heterogeneous labor force. Here, we explore another dimension of a heterogeneous platform workforce, namely the diversity of economic orientations of earners, or to use a term from economics, their "behavioral models." To sociologists, the presence of multiple behavioral models, especially among professionals or the self-employed, is not a novel finding (Fridman, 2020). Users of these platforms, who tend to be young and highly educated (PEW Research Center, 2016a; 2016b; Schor & Cansoy, 2019), profess a range of motivations for participating (Fitzmaurice et al., 2020; Ravenelle, 2017) and their dependence on platform income also varies (Schor et al., 2020a). Therefore, the existence of multiple behavioral models in this sector may be unsurprising. However, as Beckert (1996; 2003) notes, sociologists have failed to theorize "models of economic action," i.e., how individuals translate a series of preferences into behavior.

Using in-depth interview data from 102 respondents on three platforms (Airbnb, TaskRabbit, and StocksyUnited) we find that within individual platforms, there are diverse strategies for governing earning behaviors. Iterating between models found in the literature and our data, we have identified three main orientations. Some are maximizers, engaged in the kinds of activities ascribed to *homo economicus*, economists' archetypal rational actor. A second group displays a more social orientation, and although these earners are also interested in money, they are not optimizers on the financial margin. They have other goals, including sociability. But they also draw ethical boundaries around their platform work, reject opportunities that don't reflect their social preferences, or act to gain recognition. We call this type *homo socialis*. A third group, which we term *homo instrumentalis*, displays neither maximizing behaviors nor strong social preferences. They merely aim to earn, and do so in casual, habitual, or targeted ways.

We provide an account of the three models and discuss platforms' tolerance for the heterogeneity we find by discussing how earner diversity aligns with the companies' imperatives for growth. This allows us to contribute to theorizing questions such as whether platforms represent something different from conventional businesses and the extent to which they are novel forms. The paper proceeds with a discussion of theories of the platform firm, a brief discussion of the three types of earners we discovered, our methods, findings, and a section on platform responses.

2 Theorizing the Platform Firm

The presence of diverse models of economic behavior within a single platform's labor force raises questions about the nature of this type of firm. Is it more like a market, in which diversity among participants is tolerated, especially if they are willing to take lower returns? Or are these platforms more like bureaucratic firms that attempt to control the behavior of their employees? Scholars have begun to develop understandings of platform firms which shed light on these

questions. Vallas and Schor (2020) identified four approaches to theorizing digital platforms — efficiency accounts, "Uberization" and precarity narratives, algorithmic control, and a fourth hybrid conceptualization. A second set of issues concerns the behavior of earners. Is there anything novel about how people use and earn in this context, or are conventional models of economic behavior sufficient? The literature is less explicit on this question, so our discussion addresses implicit assumptions.

Efficiency accounts, which come mainly from economists, focus on the ability of digital technology to reduce transactions costs and increase efficiency (Horton & Zeckhauser, 2016; Sundararajan, 2016). This results in a shift from the firm (a command and control entity) toward the market (a voluntaristic, atomistic structure), as well as toward smaller, peer-to-peer entities (Einav et al., 2016). This view is consistent with an earlier shift to seeing firms as a "nexus-of-contracts" (Jensen & Meckling, 1976) which Davis (2016a) argues helped create "Nikefication", i.e., the outsourcing of functions, and the "vanishing" of the American corporation (Davis, 2016b). On the question of behavioral models, the economics literature has been silent, assuming that the standard models — either the rational actor or its behavioral economics cousin — prevail.

Outside of economics, the dominant perspective is "Uberization." In this view, the platform is little more than a "web page" (Davis, 2016a, p 513). Grabher and van Tuijl (2020) formulate this shift as going from employment to a "gig." Uberization is the culmination of trends such as fissuring (Weil, 2014) and precarious work (Kalleberg, (2013), which describe the breakdown of stable employment and benefits, the shift of costs onto workers, and the increasing insecurity of labor. As with the economic approach, the precarity literature generally does not focus on the heterogeneity of the labor force other than considering variations in levels of precarity. While some accounts do note that earners fall into different categories (Ravenelle, 2019), the focus is on the common worker experience of bearing costs and risks (For an exception, see Manriquez, 2019). Similarly, while ethnographic accounts describe differences among people, this approach generally avoids theorizing behavioral models and has not provided a distinctive analysis of economic action on platforms.

The third approach sees platform firms as novel entities on account of their ability to control labor via algorithms (Aneesh, 2009; Rosenblat & Stark, 2016; Griesbach et al., 2019). Algorithmic control is enhanced by information asymmetries that enhance the power of the platforms over workers. While this view does not deny the precarity of workers, it emphasizes top-down authority, an all-powerful Panopticon collecting user data (van Doorn & Badger, 2020) and a break from previous methods of control. The algorithmic approach does not typically address issues of socio-economic, demographic, or behavioral heterogeneity among the workforce, at least not from the perspective of what it might mean for understanding these firms. Instead, the key variable is the power that technology affords to platform management. A related view focuses less on labor control but on the ways in which technology affords platforms even more power than conventional firms, and allows them to expand their command and control to the markets they operate in (Kenney & Zysman, 2019; Srnicek, 2016). This literature harkens back to the early postwar era with its focus on dominant firms with monopoly power.

The fourth view sees the platform firm as novel because it is a hybrid form, combining organizational and technological factors to create a new entity. It emphasizes the networked and market relations of firms, and their departure from the conventional hierarchical corporation. Yet these accounts also hold that firms retain power over the parties with which they transact, including labor. Two contributions are especially relevant. Watkins and Stark (2018), who studied platforms in a variety of sectors, argue that these entities have evolved into a "Mobius"

firm. They have gone beyond the simple network formulation and are able to co-opt resources that are both internal and external to the firm. A related argument by Kornberger et al. (2017) is that platforms are unique because they employ novel accounting methods that move from traditional hierarchical categories to heterarchies. By introducing new evaluative methods such as ratings and reputational systems, platform firms can radically decentralize control and simultaneously centralize power. This hybrid formulation — decentralization with concentrated power — is common to this genre of platform theorization.

We (Schor et al., 2020b) have made a similar argument about the platform economy, arguing that these firms have enacted a "retreat from control" as they allow earners to choose hours and schedules and organize their labor processes relatively autonomously. While autonomy varies across platforms, in comparison to conventional service labor, platform work is generally less scripted or directed by the employer (Leidner, 1993). But while the platform allows the worker the freedom to "be their own boss," it retains power and certain forms of control, including through the use of market discipline. Market discipline may be especially relevant in low-wage sectors, such as ride-hail and delivery, where requisite skills are generally available throughout the population, which gives firms considerable latitude to recruit new earners, a key lever for affecting supply. Finally, we note that "permissiveness" varies by platform, and lower-wage workers are subject to more control than those with more market power.

Willingness to allow worker freedom of choice over schedules and total hours is a unique feature of platform management. It produces a consequential aspect of platform work — heterogeneity in when and how much earners choose to work on the platform.[1] There has been relatively little attention to how workforce heterogeneity might manifest in other ways. In our research, we discovered that within and across platforms, earners exhibit different modes of earning. This finding adds another distinctive aspect to platform firms, which we explore below.

3 Models of Economic Behavior

How should we understand economic behavior? While economists have historically produced varied answers to this question, by the 1970s, they had coalesced around a single idea for representing and modeling economic behavior — the rational maximizer. However, nearly as soon as they had, "behavioral economists" came along to trouble that fiction, with a wealth of empirical findings that violated the principles of selfishness ("fairness norms"), revealed time inconsistency in preferences, loss aversion, and non-linear probability weighting of alternatives (Kahneman, 2011). These developments revitalized ideas such as income targeting and Simon's (1957) bounded rationality and satisficing. Among economic sociologists, whose project began as a critique of the neo-classical model, the focus has been on how structures inhibit maximizing behavior. Approaches include Bourdieu's (1984) *habitus*, social networks (Granovetter, 1973), Polanyian embeddedness (Block & Somers, 2014), and "relational" economic sociology (Zelizer, 2013). However, given the diverse ways economic sociologists have explained economic outcomes, they have generally not focused explicitly on models of economic behavior. Indeed, Frank Dobbin (2007) has made the point that economic sociologists have generally

1. Another "permissive" aspect of platform work is that earners are permitted to work for competitor firms. One reason is to provide on-demand labor supply. Another may be to conform better with regulations governing employment classification (Independent Contractor versus Employee Status) (Dubal, 2017). However, while this concern may be governing the actions of a few smaller platforms, it seems not to be an overriding issue for some large ones, such as Uber, Lyft, and some delivery platforms.

accepted the view that agents seek profits. Jens Beckert (2003; 1996) has argued that economic sociologists have generally not constructed their own "models of economic action."

And what of platform actors? Which of these conceptualizations do they conform to? We found three distinct orientations — *economicus, socialis*, and *instrumentalis*. Before discussing each, however, we want to stress that all of our respondents are active on the platforms in order to earn money. If they were not, they would be more likely to be participating on gift exchange sites such as Couchsurfing (a free alternative to Airbnb) or time banks (multi-lateral barter service exchanges). Therefore, our analysis does not replicate well-worn tropes of altruism versus self-interest or money versus love (Folbre, 2001). What we find is that among a financially-motivated group, there are major differences in how people think, act and transact. That said, we note that we have not included low-wage platforms, where we would expect more conformity among earners. However, our ongoing interviews with workers in ride-hail, food delivery and shopping also suggest some diversity of orientation.

The first group we call *homo economicus*. These are classic rational, self-interested actors who pursue optimal outcomes. While they focus on maximizing earnings, what's distinctive is how they do it. They develop individualized strategies to maximize the prices they can command, often by seeking out market information. They pursue actionable information about costs, earnings, and how to improve their margins. They are engaged in continuous calculations, keep spreadsheets, pay careful attention to costs, and sometimes experiment with pricing. They strategize about ways to increase their earnings, by improving or expanding their real estate assets, sub-contracting tasks or services, or investing in their platform activities, which they think of in largely commercial terms. Ultimately, they understand themselves, and others, through a lens of idealized rational action.

Noting the shortcomings of the *homo economicus* model, the "new economic sociology" of the early 1980s questioned how social networks might clarify seemingly illogical behaviors not otherwise explained by the rational actor model (Granovetter, 1973). At economic sociology's core is the claim that economic activity has a social dimension that is integral to understanding why actors make fiscal decisions. Building on this insight, Zelizer argued that economic relations were not merely embedded in social context but that they were "continuously negotiated" and "meaningfully interpersonal" (Zelizer, 2012, p. 146). Zelizer defined this as a relational package in which actors balance four unique elements: distinctive social ties, a set of economic transactions, media, and negotiated meanings. This framing suggests a robust social actor who will weigh social incentives in their economic decisions. We term this category *homo socialis*.

Homines sociales have varied motivations and behaviors, such as meeting people and socializing, building community, or avoiding status threats. They are unified by strategies that are guided, first and foremost, by relational incentives and social considerations. They value income, but instead of spending energy tinkering with the bottom line, *homines sociales* turn their attention towards maintaining personal ethics, seeking validation, and fostering social connections. While a good number of *homines sociales* are prosocial, this category also includes individuals who draw strong boundaries to avoid particular interactions, such as tasks which involve status insults or hassles they would rather avoid. Some engage in discriminatory behaviors, even at the expense of making money. In short, *homines sociales* do not prioritize income maximization. Nor are they particularly oriented to calculative completeness or searching for market information. They are happy to participate in economic transactions that can coexist with their social specifications, but abstain from economic opportunities that violate their larger "social" orientations.

The third type we have identified, the *homo instrumentalis*, is less discussed in the litera-

ture, either in economics or sociology. Like *homo economicus*, this type is strongly oriented to making money, rather than to social relationships or social goals. However, their relationship with money is largely instrumental. Some earn for a specific purpose, such as for rent, debt payments, vacations, or even beer. Others operate with a target income — when it is reached, they reduce economic activity.[2] Our *homo instrumentalis* lacks a coherent strategy, uses simple heuristics and resists pressures to do more, or to optimize participation. They often settle for the "good enough" outcomes described by Simon (1957). They are satisficing agents, who are not compelled to spend further effort searching for marginally better outcomes (Caplin et al., 2011).

4 Methods

Our goal is to explain a variety of participant orientations in the platform economy. We therefore focused on platforms with different business models, barriers to entry, and remuneration structures. We discuss three platforms — Airbnb, TaskRabbit, and StocksyUnited. Airbnb is a platform where hosts rent rooms or entire homes on a short-term basis, at prices that are significantly higher per night than long-term rentals. Hosts set the price, manage booking requests, and clean and prepare the home for stays. Depending on the characteristics of the home, hosts might spend time with their guests, for instance if they share a kitchen or a living room. TaskRabbit is a platform for a wide range of tasks, but most are either delivery, cleaning or manual labor tasks such as moving (Cullen & Farronato, 2018). In the first version of the platform, workers used an auction model to bid on posted tasks. In 2014, auctions were replaced with a model where customers search an inventory of Taskers and select one based on hourly prices and profile descriptions. The third platform, StocksyUnited, is an artist-owned and governed stock photography co-operative. It has a competitive, limited membership of over 1000, and members make major decisions. Members' work is included on the company's website and sold at a flat rate determined by the management. In contrast to Airbnb and TaskRabbit providers, Stocksy artists do not set prices. However, they can boost their sales and increase earnings by investing in photo shoots and tailoring their work to the market. They also control how many photographs they submit.

We conducted 102 semi-structured interviews, scheduled for 60 minutes, although some lasted longer. Most Airbnb and TaskRabbit respondents were located in Greater Boston and were interviewed in person, but a few lived in other US cities and were interviewed by videoconference. Stocksy interviews were done online, as members span the globe. Airbnb and TaskRabbit interviews began in 2013, and continued until 2017; Stocksy interviews were conducted in 2017 and 2018. We recruited Airbnb earners initially by messaging them on the platform, but switched to snowball sampling and social media as the platform deactivated the accounts we were using. For TaskRabbit, we hired interviewees through the platform with the interview as the "task." We recruited Stocksy members with the help of management, who provided a list of names and emails. We contacted members and asked them to schedule an interview.[3] Compensation was initially $30 per interview, and was subsequently increased to

2. While ideas such as target incomes were common among economists in the past, they have become less so recently. An influential paper on income targeting among NYC taxi drivers (Camerer et al., 1997) has been challenged by an Uber study which found that although some drivers start with target income strategies, many transitioned to maximizing behaviors (Chen et al., 2015).

3. A few Airbnb earners were excluded from our sample because they had not operated on the platform long enough to establish an identifiable behavioral orientation.

$40. Demographic details of our sample can be found in the appendix.

All interviews were transcribed. For the qualitative analysis, we sorted our interview transcripts by platform category and assigned a principal coder to each group, to make it easier to compare different logics within the respective platforms. We began with a round of open coding, in which we developed basic descriptive categories around narratives of self, platform goals, and economic practices, which we discussed as a team in subsequent memos and meetings. For example, we noted that some Airbnb hosts used demand-estimation strategies in order to optimize their prices. Quotes from such participants were distributed to all team members and in discussions we agreed that such a practice is characteristic of *homo economicus*, because it contributes to the larger goal of maximizing platform earnings. After agreeing on ideal-types for *economicus, socialis*, and *instrumentalis*, which we detailed in a shared codebook, we read all transcripts and coded all participants in a round of systematic and theoretical coding. Throughout the process, we frequently returned to the codebook, made adjustments when necessary, and continued to write and talk about our participants and their practices, until we had formed full coding consensus on our participants (Table 1). We had a small number of hybrid cases which displayed features of more than one model. This process meant that while we began with three ideal models from the literature, we developed and elaborated on their features through analysis of our data.

5 Findings

Homo Economicus

Homines economici are not distinguished from others by their motives. As noted above, nearly everyone in the sample is interested in making money. Rather, they are characterized by their maximizing orientation to earning and efficiency. In the words of Ryan, a Tasker, being on the platform is "very much a cost/benefit analysis that I run at every opportunity." For many, these calculations result in effective strategies to set their prices or investing time and resources into the work to maximize their earnings. They also fastidiously document and calculate expenses and earnings, and display great personal command of the financial details of their participation. Their orientation is often reflected in their discourse, which analogizes various aspects of the platform and their own participation to an idealized market.

For some, maximizing orientations developed over time. Gustav is a full-time photographer who had moved from Sweden to Mexico, which allowed his Stocksy income to stretch further. Gustav readily reinvests his money in Stocksy, hiring local experts that get him access to unique spaces such as medical facilities. Gustav explains:

> Follow the money is a way to do it. You could keep it a hobby but I figured out very quickly that certain photos don't sell at all or very little... So yeah, if I want to have this as my job, if I want to have some income, I better focus on the thing that sells.

On Airbnb, thirty-one-year-old Pete, born and raised in Boston by parents who immigrated from Cape Verde, had a similar experience. In 2011, he purchased a big house from a 90-year-old who had lived there for decades and he now sublets several rooms to pay for renovation costs and the mortgage. Initially he was "afraid" of using Airbnb, but an encounter with an Uber driver who had two successful Airbnb listings convinced him to give it a try.

> I started off at $60 a night because ... I used to rent [out the room] for $600 a month ... So even if I rent it for ten nights I'll still be making what I used to make. And it got booked up. ... So in June I'm like, why don't I charge more? So I started charging more, and I was getting it. ... My most successful month was August where I made $5,500 dollars.

The maximization orientation leads participants to identify platform-specific strategies to reach their goals. On Airbnb and TaskRabbit, price setting is an important strategy. Stanley, who is white and 26, manages his short-term rental unit on a full-time basis and says he can reach 90% occupancy during busy periods. He adjusts his prices during the year, especially during winter, when demand is low, but also during the week, "because not every night is worth the same." He uses Airbnb's price suggestions, which adjust rates by seasonality, but overrules the suggestions at times to further optimize his earnings.

> The algorithm that they use to determine [prices]... doesn't really scale that well to each individual city because there might be an event coming to town or something. Their price tips aren't going to be all that great for predicting that. So, you do kind of have to know. It is a little bit of a learning curve...I've kind of done that to adjust the price.

Rich, a white Tasker in his 40s, struggles with poverty on TaskRabbit and is just able to pay his monthly bills. It is not for lack of trying. He has unique strategies for securing earnings:

> What I often do in order to get something assigned to me is the guy may say, 'I'm thinking $100,' and I'll be, like, 'Look, unless it's a total train wreck when I get there, I'll do it for $75.' So I always just, like, bring the price way down. And then at the end they end up just paying you the money anyway.

Rich is also aggressive in his pursuit of tasks: "To me it's a numbers game. Maybe I have 40 open bids going at once. Maybe that's not very smart. But if it's a numbers game, why not?" Rich's "game" analogy is telling; by pursuing multiple bids at once, technically allowed but discouraged by the platform, he is able to pick and choose the most lucrative opportunities.

Ralph, 26, moved to the US from Haiti for his college education. While finishing his degree, working a full-time job and pursuing many opportunities to make money on the side he had completed about 15 jobs on TaskRabbit, sufficient for him to develop a keen understanding of the prices he could command:

> Personally, everything over $50 [an hour] is great...You get a lot of $55s or $62s. Those are great to me. Because over $50, if you spend two hours, that's $100 right there. Even though ...you end up getting paid like $42 [because of the platform's fee], which is still like closer to $100 if you spend two hours. So, me, I always, if it's over $50, I'm always down for it. I take a lot of, like, $40 an hour, $45s and stuff. Those are good, too. I don't bother taking the $25 because you get paid like $19, $18 or even $16. It's not worth it.

On Stocksy, the cooperative sets a flat licensing fee for all photos, so members are left to pursue strategies to maximize their sales volume. Some photographers seek editorial critique to improve their work, while others study sales data to boost their sales. Milo, who is white and 43, used to work in software development but had transitioned into making his photography hobby his primary work. His strategy to maximize sales volume is "[d]ata driven..."

> If I want to grow the Stocksy portfolio I would have a look at search terms. So I would analyze what are people searching, in which different areas in the world? What are they looking for?"

Homines economici on Airbnb and TaskRabbit pay close attention to prices, time spent, and competition. Aaron, a white 25-year-old pharma researcher with a condo in the heart of Boston uses Airbnb to finance his wedding. He spends considerable time figuring out how to price his unit:

> You do a little comparative analysis to see what the hotel rooms are in the area ... and what other people's homes look like that are at the price range you're at, what people are willing to pay for homes that are, in my opinion, a little less extravagantly nice than my home, and be, like, "Oh, if people are paying for this home at that rate I can go up a little higher, too."

Aaron's attention to what the market will bear is typical of a number of the people in this group. Eric, who is white and 31, manages a friend's apartment on Airbnb. He tries to maximize revenue and minimize his workload, mainly by avoiding short stays because of the work of communicating, exchanging keys, and cleaning.

> I do tinker with [the calendar], and I tinker with the price, and I have a different weekend rate, and I change the price for the next two weeks if they're still empty, so I charge more out front. You know, I'm playing with it, trying to figure it out.

For Taskers, optimization sometimes means a focus on travel distance, time, and costs. Ralph, introduced above, lives about an hour north of Boston and typically gets tasks that require significant driving. He explains his process for deciding whether to take one:

> I think about, okay, so how far am I driving? Because my car's really good with gas... when I'm accepting the task, I do a quick calculation. I'm like, okay, so this, this, this... is it worth it? Is it worth it? Yes, it's worth it. Then, boom. I go do it, I get paid. That's it.

Unlike quite a few other maximizers, Ralph does not write the distances down and instead will "go back to it after I get paid to see if I actually benefited," but his larger orientation is calculative.

Stocksy's cooperative model includes end-of-year profit-sharing for all members. This leads to maximizers trying to get other members to sell more. Some use the community forums to espouse best practices in hopes that it will encourage others' maximizing behavior. Stocky's *homines economici* are often critical of members who fail to adopt their data-driven strategies. Derrick, a white commercial photographer in his seventies who specializes in industrial photography, says he has found a niche and always strives to become more adept at his specialization to increase his earnings. However, he resents peers that "only wanted beer money" and are not "serious" enough:

> They're not investing, reinvesting into stock, they're not seeing it as a business. They're seeing it as an artistic passion and there's a place for that, God bless them, but that's not how you build a successful agency. You cannot build it by holding the hands of brand new shooters who don't know how to run this as a business. They don't have enough editors, they don't have enough psychiatrists, they don't have enough people who can put up with the bullshit.

Almost all earners in this group invest significant time and resources into their platform activities. Taskers buy new tools and build up their skills, Airbnb hosts renovate and decorate their properties, Stocksy members invest money in their equipment and shoots. Juan, a Hispanic 28-year-old who is a full-time accountant and an active Tasker has a keen understanding of the platform, including the diversity of available tasks, skills and education levels required; factors that affect the length of time a task will take (e.g., traffic, the client's expectations) and the hourly rate. He started a small translation business, securing tasks on TaskRabbit and subcontracting the work to translators he found on Odesk. Investing his own money in these subcontractors allows him to offer a large number of languages. Juan explains that "TaskRabbit is the ultimate capitalist tool, really. I mean, you will make as much money as you're willing to put the work into." And while many saw things just in terms of their own efforts, others based their participation on ideas of idealized markets. Mark, who is 32, explains how he deals with the occasional lulls in TaskRabbit demand:

> [F]rom the way the markets work, a market term, I know something will come up tomorrow. I don't know how many. I don't know if I'll do one job or two jobs... There's no guarantee... I guess maybe the way any market works. There may be one or two slow days but then everything kind of catches up.

Homo Socialis

Unlike the previous group, *homines sociales* have primarily social motivations. Many championed the platforms as a way to connect to others. Some flock to the platforms for esteem-related reasons, using them as avenues to feel productive or helpful. Others are less interested in social dynamics but see economic gain as secondary to maintaining personal boundaries. Though the rationales are diverse, this group prioritizes social goals. The platforms are spaces of social connection but also spaces to navigate status identities and personal ethics.

Socially-oriented Stocksy artists primarily frame their involvement as an outlet for creative passions instead of a paycheck. As a brand, Stocksy emphasizes "boutique" stock photography. Drawn to this aesthetic, members prize artistic autonomy over the profitability of their photos. As a result, they often struggled to balance their creative outlook with the demands of the competitive stock photography market. Olivia, who is East-Asian and in her twenties, had made a major career switch from the medical field to photography. To her, this change signifies prioritizing passions over profit: "I want to stay true to my voice and I'm growing as an artist. A lot of things change and I'll probably lose audiences and I'll probably lose some business too but the artist part of me is like, this is real and this is honest, you have to do it."

Although these artists value income, they often view profit-maximizing strategies as antithetical to personal ethics. Kayla, a 48 year old and white, had started in graphic design but transitioned to stock photography after receiving a high-tech camera as a gift. Kayla wants to make a living from stock but was not willing to adjust her artistic choices to do so. She enjoys photographing macabre subjects — decaying plants and animals found in the arid landscape of her hometown. However, this "dark" imagery rarely sells and the site's editors are encouraging her to consider new subject material. She was even contacted by some *homines economici* who provided strategies for increasing income. A key suggestion was forgoing artistry for profitability. To Kayla, this was an affront to her artistic identity. When asked to favor commercial demands over her vision, she has a visceral reaction: "It hurts my heart." This group prioritizes personal ethics over earnings — whether by staying true to their "art" or refusing to charge what the market will bear on Airbnb because it feels unfair to the landlord, who charges a lower rent.

Homines sociales frame market interactions in relational terms, filtering for particular social experiences. While *economici* hosts on Airbnb are more likely to accept all interested parties, *sociales* tend to be more selective, cherry-picking candidates who match their criteria. A case in point is Emilio, a 33-year-old internet marketer. He was renting out a spare bedroom in his Cambridge apartment but had earlier offered a full apartment in the city and other listings. He has typically earned about $6,000 a month from Airbnb. He lowers the price of his rental below market value to increase inquiries, allowing him to judiciously select the "right kind" of visitor. He estimates that he has had over 1,300 inquiries but has only accepted about 66.

> I want people who are going to cause me no problems. That is more valuable to me than profit maximizing... every time I've taken on someone who I kind of knew in the back of my mind they could be a problem, it's never been worth it.

Emilio also discriminates against potential renters for their nationality and age, because he wants to avoid "discomfort":

> One time I hosted someone from, it was somewhere in Eastern Asia. I don't know where exactly. The food they cooked smelled awful... There was another time, I will never forget. There was this one German man who was in his probably his forties... I was in my late twenties. It's an apartment in Allston. It's a college house. It's a clean college house, but it's a college house. He was just super high maintenance. I ran into that again with another Eastern European older man. Now I'm like, no older people, you need to be young.

Other *homines sociales* hosts are less discriminatory and excited by the opportunity to meet and speak with a diverse clientele. They view Airbnb as an opportunity to step outside of their normal social bubble. David, who is 30 and is originally from Croatia, "loves" spending time getting to know his renters. He thinks of himself as a local ambassador, enriching the travel of his guests:

> I met some such cool [people]... So there was a young couple from Munich. They had only started dating like a month before they decided to like take a trip to America. It was so cool because, you know, they were there for four or five nights, and it's almost like we're... they're learning about each other as I'm learning about them.

Whether their choices lead them to have more or fewer guests, *sociales* use the platforms to manage their social preferences and seek out interactions that will be the most rewarding to them, even at the cost of income.

Because *homines sociales* are more concerned with social incentives, they are cautious to invest funds to maximize profits. From poorly-behaved renters to high-cost gear, they believe that risky choices are "not worth it." Before entering the stock photography industry, Lisa, white and in her forties, had been a painter. She eventually transitioned to photography as it demanded less time than painting. For Lisa, Stocksy is a side gig that gives her the freedom to explore different passions. She uses the platform to seek validation for her work. However, when she experiences editorial rejection, she takes extended breaks from the platform. To her, Stocksy is already an emotional gamble — will her talent be recognized by the platform? Will she feel vindicated? Or will she experience a crippling rejection? Investing income in addition to that emotional gamble makes rejection all the more difficult:

> And it's funny. It's emotional too because some people will invest and myself included, gobs of money doing a photo shoot and it's a leap of faith because it's doubly speculative, right? It's like double jeopardy. First of all, you're hoping you get through the gauntlet of the editors. Second of all you're hoping a buyer buys it. So it's very crazy to invest money.

Lisa invested in creative projects and turned a profit but that success doesn't outweigh the moments in which staff rejected a costly photoshoot. She holds onto the negative experiences as proof that financial investment only intensifies the emotional risk of rejection.

Many *homines sociales* are invested in the sociability of the platforms. Despite the brief nature of most TaskRabbit interactions, these Taskers try to form bonds with their clients. Paul is a Black man in his early 30s who mostly does furniture assembly and handyman tasks. He highlights the importance of meaningful interactions with people. He recalled a task where he helped a Jewish family with their Seder dinner, "I learned a lot, you know, I was able to have a great conversation with them and share some thoughts, and vice versa." For him "it's just really cool meeting people, talking to people, and learning from them, and trying to share things with them that I may know. It's really a cross-pollination-type experience." Some of his interactions even evolved into personal relationships. For this group, connectivity is not merely a characteristic of the work but a boon that encourages further involvement.

Homines sociales often frame their engagement on the platforms in terms of wider networks of helping, aiding those in need of their services, which is its own reward. For some, feelings of usefulness countermand frustration in their primary jobs. Hope is a 29-year-old white Tasker who enjoys feeling productive and appreciated on the platform. She works as a substitute teacher in the public school system and expresses dismay at being ignored as "Miss Smith the sub." Yet, on TaskRabbit, she feels as though her work has more of an impact: "It makes me feel useful... so yes it makes me feel really good... I'm actually doing well and helping people, which is another thing I really like to do." The positive valuations from "helping" are an important incentive for some.

Similarly, some *homines sociales* reject tasks that make them feel undervalued. Some are seen as status insults, asking for menial work below their skill levels. Elise is a 24-year-old Tasker with an MA in a science-related field. She works in a lab as her primary occupation but uses TaskRabbit to help with her $40,000 in student loans. However, she refuses work that undermines her status identity, even easy tasks such as buying and delivering a latte: "Like no, get off your butt and get it yourself. Because that's lazy." Her sensitivity to status slights is another characteristic separating her from *homo economici* — she is "leaving money on the table." The low social status of much of the work on the platform clashes with her sense of self as a highly-educated professional. She draws strong boundaries to exclude certain tasks and preserve her social identity.

Homo Instrumentalis

As with the other two groups, *homines instrumentales* are motivated by making money on their respective platforms. This is the primary goal they express during their interviews, similar to *homo economici*. However, they pursue earnings in a different way. Their activities are frequently centered on a target income, either a pre-set amount, or enough to cover specific expenses, such as rent, or a vacation. To reach their targets, they follow a scattershot approach to pricing and activities, relying on simple heuristics rather than calculations or information-seeking. They are often resistant to expanding their earnings beyond the target or optimizing

their pursuit of it. For some, this resistance is rooted in a more tenuous commitment to prioritizing their work on the platform, despite their desire to make money.

Lucy, a white 34-year-old Airbnb host, is a self-described member of the upper class, with assets valued at more than $14 million. She has hosted people on more than 50 occasions, and uses that income to pay for her mortgage and hobby:

> I have horses. More than one. They cost a lot of money... Basically I do my Airbnb... to pay the horse board every month... Otherwise it pays the mortgage... money is allocated for those two things.

Elisabeth, a 31-year-old Latina who works full-time on TaskRabbit, is on the other end of the wealth spectrum. She is living at home with her parents, feeling humiliated by the loss of a previous nanny job and the need to ask her parents for money for bus and subway fare. She uses her earnings to see her boyfriend who lives in another state and her goal "is to actually make ten-thousand dollars to go to Israel for a month... That's a long way off for the time being."

Earners in this group do not articulate an overarching strategy for how they pursue this income. Instead, they describe patterns of behavior that are the result of simple heuristics that can operate without the commitment of time and resources that go into the decision-making processes of *homo economici*. Elisabeth explains that she bid for the task of the interview by referring to two focus groups she had done for iPhone apps, for which she'd earned $20 and $40. "So I figured, 'Okay fine I'll go somewhere in the middle. I'll say, you know $25. It's only an hour.' " She explains that she does cleaning and organization tasks "because they're quick and easy, honestly. Very straightforward, no hidden things... I want to know that I cleaned your house, it's clean, and I'm gone. I don't want things that sort of linger." Christina, who is white and in her twenties, is a Stocksy member who has successful enterprises as a photographer and yoga instructor outside of the platform. She enjoys balancing different projects, but for her Stocksy is primarily a good way to further monetize work she was already doing, so she snaps a few Stocksy photos during her other gigs. But beyond circulating leftover images, she is not interested in doing Stocksy-specific work.

For some, the simple heuristics are the result of financial struggle. George, a Black visual artist in his late twenties, is dependent on TaskRabbit to pay expenses that aren't covered by his precarious art-related income. He reports that he would take any task he could get on the platform. "So I was just trying to stay financially stable so that's why my prices were kind of scattered, like $50 here, $25 here, $100 here." When we asked him about any risky interactions he might have had with deliveries of packages that may contain illegal items, an issue others have identified (Ravenelle, 2019), he explains:

> That's the thing about me, maybe it's bad or maybe it's good but I don't care. As long as I don't hear anything ticking in it, I'm all right, I'll bring it there and that's it. Like I don't care, like just because TaskRabbit to me is like out of desperation, like I need this money.

Homines instrumentales are not interested in expanding their work on the platforms or optimizing it to maximize their earnings or minimize their labor. Angela, a 46 year old and white, balances being a "semi-professional photographer" with her university lecturing. She likes that Stocksy allows her to monetize previously neglected work but was wary about investing in photoshoots. To her, the gamble is not worth the risk: "I try not to invest too much into shoots because also I wonder whether or not it will repay." Theo, an East-Asian 32-year-old Tasker

and a recent college graduate who is weighing whether to go to graduate school, turns down anything that requires him to drive or go into the city. Most of his tasks are from the first-come-first-served option on the app. He also dislikes competing with other Taskers, despite his strategy for setting hourly rates:

> I generally try to put my rates around average. I do that because I don't consider myself a professional in these services... I don't think it would make sense to really charge that much more than other people.

Anna, a 28-year-old South-Asian who hosts on Airbnb on rare occasions, has typical monthly earnings of $150. Describing her price-setting, she shares an interaction she had with a prospective guest: "I think we just said, oh, $100 bucks [a night] sounds right, and we just went for it... they said, well, if we're staying for two nights, can we just do $150, and we were like, yeah, sure."

For some people in this category, attachment to the platforms is tenuous. On Stocksy, this lack of commitment translates to a lack of engagement with the cooperative aspects of the platform. Christina, introduced above, puts it best: "I don't interact with the people too much... I know a lot of fellow photographers are also on the site. So in turn I follow them. I check their stuff out. It's a very, very small interaction."

6 Platform Behaviors

An obvious question raised by our findings is whether platforms will continue to tolerate diverse earnings strategies. Given that platform investors and operators generally prioritize growth and subsequently profitability, will they continue to accommodate providers who do not maximize? If they do, it lends credibility to the view that they represent a new kind of hybrid firm. To find out how platforms adapt to provider strategies and to what extent they attempt to modify these behaviors, we draw on our interview data, personal experiences with the platforms, and archived website data from our three cases. Although none of the platforms has eliminated lower-performing earners, all three have made policy changes that nudge providers towards more lucrative earning strategies.

TaskRabbit's model has evolved in a way that disadvantages *homines sociales*. Its original setup was a bidding system in which clients posted a task and interested Taskers responded by quoting a rate. Clients then chose among those bids. Taskers had agency in this system and none of the three earner groups were particularly privileged. Moreover, clients and Taskers could discuss prices and details, even outside of the platform. Although highly-reviewed Taskers benefited from the bidding system, less-experienced Taskers could use their profiles and private communications to advocate and establish rapport with clients. In 2014, the company overhauled the system in order to increase the volume of transactions. The new version — an app for smartphones and tablets — lists task categories and blocks off-platform communications. Pricing also went from per task to hourly. Though Taskers set their own hourly wage rates, the platform suggests ranges. Taskers are free to decline requests, but this lowers their acceptance rating and results in lower algorithmic priority. The new system also added a "quick assign" feature in which the algorithm suggests matches. Quick assign simplifies selection but it caters to *instrumentales* at the expense of *sociales*, who no longer have access to their established clientele. In addition, the system began to prioritize "Elite Taskers," a designation which requires completing a significant number of monthly tasks and being

in the top five percent of earners on the platform. Given their maximizing tendencies, this created an advantage for *economici*. Further signs of Tasker professionalization and nudges toward optimizing behavior include new features of the app, such as a dashboard titled "Your Performance," which highlights "Needs Improvement," categories such as measures of "Task Acceptance," "Task Completion," and "Response Rate."[4]

Stocksy has also made efforts to monetize the work of its contributors. Originally, Stocksy recruited well-established photographers to join the platform. More recently, it is expanding its membership to increase and diversify the collection. The staff prioritizes selecting members who mesh well with the existing brand and elevate its aesthetic. In order to minimize competition among members, the staff tries to find "niche" photographers who can add to the collection without cutting into existing members' profits. While staff attempts to accommodate individual situations, they did hold a vote to institute a cut-off for inactive members. The staff holds weekly editorial meetings and selects pictures to promote in the curated feeds, to highlight more marketable work. Archived data from the website suggests that management has steered the co-op towards more artistic or alternative works, to develop its market niche. In order to protect Stocksy's brand, staff regularly reject submissions that fail to meet their standards. On the site, photographers have their "Assets" and "Followers" listed — metrics that serve as proxies for the quality or popularity of their work, similar to ratings on TaskRabbit and Airbnb. Photographers are given incentivizes to add large numbers of photos to the archive, but management still tolerates low activity, presumably because low earners do not incur a cost for other co-op members. When photographers experience high rejection rates or low sales, staff reach out to provide guidance and brainstorm solutions. Because Stocksy is a co-op, there are community-wide forums to voice issues, celebrate successes, and discuss the future of the platform. *Homines economici* reach out to other earners to encourage profit-maximizing and increase shared payouts. When these discussions become heated, staff may step in and "put a pin in them" to de-escalate tensions.

Airbnb has also made changes that are relevant to earner behaviors. In 2015, the platform introduced "smart pricing," an optional tool that set rates automatically, in order to boost occupancy and earnings. The tool draws on more than 70 different variables to predict "shifts in the market," such as adjusting for seasonal pricing.[5] The platform also introduced "Instant Book," a feature that lets guests book accommodations without waiting for host approval, not unlike TaskRabbit's "Quick Assign" feature. Airbnb also started promoting a new insurance policy, thereby reducing guest screening and the need for rapport-building. Reviews have become more detailed, and now include six categories (location, cleanliness, etc.). The online system promises confirmation within 24 hours and measures host response rates to encourage this. Hosts who fail to reply within 24 hours have their response rates reduced, and the pending reservation request is automatically declined. Failure to reply also affects a listing's search placement. Moreover, the response policy covers replies to messages during a stay, such as requests for information and help. While bookings can still be cancelled, doing so now incurs financial penalties. The company also sanctions hosts who fail to meet review standards. One of our participants — a *homo socialis* who reduces rates to lower guest expectations — received a warning from Airbnb that cited her ratings of four or less stars. Responsive and highly rated hosts can now earn the title of "Superhost," which prioritizes their listings. Airbnb is also taking an increasingly interventionist approach as a mediator of exchange: sending frequent email re-

4. http://www.designbychrislam.com/taskrabbit-tasker-experience

5. https://airbnb.design/smart-pricing-how-we-used-host-feedback-to-build-personalized-tools/

minders to hosts, prompting responsiveness to bookings, offering tips for increasing earnings, and sanctioning hosts who fail to meet standards. Hosts who wish to be favorably placed in search results now need to read the platform's fine print and be diligent in their hosting behavior, a *modus operandi* that suits *homines economici*.

Notwithstanding the push towards professional standards on Airbnb, there is no meaningful discrimination against low-activity hosts. One can still be a Superhost with infrequent bookings. While designing the smart pricing tool, the company interviewed both hosts who depend on their Airbnb income and supplemental earners, to gauge pricing needs in relation to income goals. Airbnb's tolerance of differing hosting needs is notable, because it means that *homines sociales*, the largest group in our Airbnb sample, can continue to choose guests based on personal preferences so long as responsiveness and ratings remain high. On the other hand, the push towards professional hosting standards may be altering guests' expectations. Many of our participants complained that compared to early adopters, recent guests are less interested in social connection, and the platform's actions may be exacerbating this trend. We also find that Airbnb's more stringent demands are less compatible with a *homo instrumentalis* approach. However, automatic pricing and instant booking features do support this group's hands-off approach to hosting. *Economici* in our sample took advantage of some streamlining features like instant booking, but continued to make individual calculations.

Surveying platform actions over the first decade, we find that platform earners are managed from afar, sometimes with a firm hand, but more often in subtle ways that sustain autonomy. For instance, Airbnb tells hosts how to increase their margins by using its pricing and booking tools, rather than helping them use the platform's affordances for sociability. These efforts arguably nudge participants towards adopting a double-entry-bookkeeping perspective on hosting, but do not mandate it. Opportunities for maximizing are further enhanced by a growing list of auxiliary services associated with platforms. These include Taskers subcontracting out work, Airbnb hosts hiring professional cleaners, or Stocksy artists employing assistants. The *sociales* and *instrumentales* in our sample might resist pushes towards maximizing behavior especially on Stocksy and Airbnb, where occasional participation is still acceptable. For *economici*, there may be a growing tension between agency and efficiency as more processes become automatic.

Larger, external factors are also affecting platform changes, such as regulatory policies and competition from other companies. On-demand services have seen increased pressure from labor activists and politicians to classify workers as employees, in order to grant them essential rights that independent contractors lack, such as a minimum wage and unemployment benefits. This is not an immediate threat to any of our platforms, but competitive pressures and market conditions are relevant to all three. TaskRabbit faces strong competition from other on-demand labor sites, and has moved away from deliveries, at least in part due to the emergence of major courier and food delivery apps. Though Stocksy's "boutique" aesthetic initially set the co-op apart from Getty and Alamy, those industry giants have begun to imitate the Stocksy brand. In an attempt to counter these moves and gain economies of scale, Stocksy partnered with Adobe Stock in 2017 and increased membership in order to meet the demands of an expanding clientele. However, this has resulted in unintended competition among Stocksy photographers as more members enter existing niches. Airbnb, by far the largest of our three platforms, grew in part because it resided for years in a gray area between work, subletting, and "sharing." This ambiguous classification helped market actors escape taxes on their income, making it more profitable and attractive, which in turn boosted the company's capacity for expansion. Moreover, the company's dominant position in the home-sharing market gave it

ample time to experiment with how to operate a platform with a plurality of participant motivations. Increased regulatory pressure might change this. In 2019, Airbnb commenced automatic collection of State Sales Taxes and Local Occupancy Taxes in Massachusetts, where our participants reside, and similar initiatives have been implemented elsewhere. The platform's success has also encouraged a number of resourceful challengers, including Marriott International.

7 Conclusion

How can we theorize these digital platforms? We have argued for seeing them as hybrid entities that give earners more control over their actions than conventional firms, but which also exercise distinct mechanisms of control. We found that multiple approaches to earning co-exist within a platform: *homo economicus*, *homo socialis*, and *homo instrumentalis*. We then asked, is the continued presence of the latter two groups, who typically work and earn less, sustainable for the companies? To answer that question, we reviewed relevant policies and platform affordances. We found that all three companies have instituted changes that nudge providers in the direction of a maximizing orientation, with TaskRabbit being the most aggressive in this regard. However, their behaviors are nudges, rather than directives. None of the three have made it impossible for lower-activity participants, or *homines sociales* and *instrumentales* to continue on the platforms. The platforms appear to be tolerating the diversity we have identified. This suggests that the hybrid designation, as theorized by Watkins and Stark, Kornberger et al, and Vallas and Schor, is robust to the presence of multiple earning orientations.

That said, there is some movement in the direction of promoting the *modus operandi* of *homo economicus*, via platform design, management practices, and the broader ecosystem of auxiliary services. Many of the market devices that modify behavior in our three cases — response rates, popularity metrics, elite status and curated ordering of entities for sale — are standard in the gig sector. A central question for further research is how will earners respond to these converging trends? In particular, what happens to those who feel that the platform economy no longer works for their original goals? Do they assimilate; do they seek out alternative platforms; or do they give up on platform work altogether? And as these and related platforms grow into their second decade, will regulatory and market forces make it difficult for them to host the heterogeneous earners that we have found in the first decade?

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	Airbnb	Stocksy	TaskRabbit	Total
Homo economicus	8	8	8	24
	(18.6%)	(28.6%)	(25.8%)	(23.5%)
Homo socialis	19	12	11	42
	(44.2%)	(42.9%)	(35.5%)	(41.2%)
Homo instrumentalis	15	7	9	31
	(34.9%)	(25.0%)	(29.0%)	(30.4%)
Hybrid cases	1	1	3	5
	(2.3%)	(3.6%)	(9.7%)	(4.9%)
Total	43	28	31	102

Table 1: Distribution of Behavioral Models Within Platforms

	Homo economicus	***Homo socialis***	***Homo instrumentalis***	**Hybrid cases**	**Total**
# of respondents	24	42	31	5	102
Mean age	33.5	30.6	31.8	31.8	31.7
Gender					
Female	6 (25.0%)	24 (57.1%)	14 (45.2%)	4 (80.0%)	48 (47.1%)
Male	18 (75.0%)	17 (40.5%)	17 (54.8%)	1 (20.0%)	53 (52.0%)
Other	0 (0.0%)	1 (2.4%)	0 (0.0%)	0 (0.0%)	1 (1.0%)
Race					
Asian	2 (11.1%)	5 (18.5%)	3 (12.5%)	1 (25.0%)	11 (15.1%)
Black	2 (11.1%)	1 (3.7%)	2 (8.3%)	1 (25.0%)	6 (8.2%)
Hispanic	1 (5.6%)	1 (3.7%)	3 (12.5%)	1 (25.0%)	6 (8.2%)
White	12 (66.7%)	22 (81.5%)	19 (79.2%)	2 (50.0%)	55 (75.3%)
Other	3 (16.7%)	3 (11.1%)	0 (0.0%)	0 (0.0%)	6 (8.2%)
Educational attainment					
High school or less	1 (4.5%)	2 (5.6%)	1 (3.4%)	1 (20.0%)	5 (5.4%)
Some college	4 (18.2%)	4 (11.1%)	4 (13.8%)	1 (20.0%)	13 (14.1%)
College	14 (63.6%)	21 (58.3%)	11 (37.9%)	2 (40.0%)	48 (52.2%)
Graduate	3 (13.6%)	9 (25.0%)	13 (44.8%)	1 (20.0%)	26 (28.3%)
Household income					
$0-25k	4 (19.0%)	12 (41.4%)	9 (37.5%)	1 (20.0%)	26 (32.9%)
$25-50k	5 (23.8%)	6 (20.7%)	9 (37.5%)	2 (40.0%)	22 (27.8%)
$50-75k	4 (19.0%)	5 (17.2%)	3 (12.5%)	1 (20.0%)	13 (16.5%)
$75-125k	5 (23.8%)	5 (17.2%)	2 (8.3%)	1 (20.0%)	13 (16.5%)
$125-250k	3 (14.3%)	1 (3.4%)	1 (4.2%)	0 (0.0%)	5 (6.3%)

Appendix: Selected Demographic Characteristics of the Sample

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Pre-Automation: Insourcing and Automating the Gig Economy

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Abstract

This paper examines a strategic configuration in the technology, logistics, and robotics industries that we call "pre-automation": when emerging platform monopolies employ large, outsourced labor forces while simultaneously investing in developing the tools to replace these workers with in-house machines of their own design. In line with socioeconomic studies of imagined futures, we elaborate pre-automation as a strategic investment associated with a firm's ambitions for platform monopoly, and consider Uber, Amazon Flex and Amazon Delivery Services Partnership Program drivers as paradigmatic cases. We attempt detection of firms' pre-automation strategies through analysis of patenting, hiring, funding and acquisition activity and highlight features of certain forms of gig work that lay the infrastructural foundations for future automation. We argue that certain forms of platform labor may be viewed dynamically as an intermediate arrangement that stages outsourced tasks for subsequent insourcing through automated technologies, and discuss the implications of this configuration for existing theories of outsourcing and technology-driven job displacement.

Keywords: gig labor; platform capitalism; outsourcing; automation; imagined futures.

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1 Introduction

In October 2014, Amazon purchased a warehouse in central Manhattan on Thirty-Fourth Street. Two months later, it rolled out its Prime Now service, which was soon available across New York City. Work was coordinated via platform. Delivery workers met at the warehouse to pick up ordered goods and deliver them within two hours of ordering. Although New York City housed highly skilled bicycle couriers and drivers who could expertly navigate the city streets, Amazon employed those who were simply willing to walk. Following this proof of concept, Amazon rolled out Prime Now to other boroughs in New York City and then to other major US cities, followed by the Amazon Flex gig-based personal vehicle delivery platform in 2015 and franchisee-based Delivery Service Partnership Program in 2018. By late 2019, reportedly over 3 billion packages, representing approximately half of Amazon's total, were delivered through these platform-based channels (Statt, 2019).

Yet there is a parallel story alongside this explosive growth of an increasingly pervasive, rapid, and outsourced last-mile delivery service. Amazon applied for its first three aerial drone delivery patents in the spring of 2014 (Kimchi et al., 2014; Navot, Beckman, et al., 2014; Navot, Kimchi, et al., 2014). During the same period when the logistics application for Prime Now was being coded, the New York City warehouse was being purchased, and the delivery service initiated in August through December of that year, Amazon filed for 30 additional patents for aerial drones, including supporting a drone's ability to carry packages, recharge on the fly, avoid obstacles and maintain ballast. The company began to lobby the FAA and local agencies for permission to deploy aerial drones in the crowded New York City airspace, gaining experimental approval in March of 2015 and petitioning for full approval in August of 2019.[1] Thus, at the same time that Amazon was investing in the construction of new contract labor networks, the firm was busy developing the aerial drone technologies and regulatory relaxation to replace the very workers it was newly employing on the streets. By 2019, CEO Jeff Bezos promised that Amazon drone delivery would be available by the end of the year, fulfilling corporate investment begun over five years earlier.

Amazon is not alone. Uber Technologies was founded in San Francisco in 2009, and soon embarked on a politically explosive expansion around the globe. The service allowed car-owners to co-ordinate with those who needed rides via an algorithmically managed smartphone app, driving strangers around for a charge. The system posed a disruptive challenge to regulated taxi industries, and helped augur the much-discussed growth of platform-based, algorithmically-managed gig labor as a new modality of contingent work (Berg & Johnston, 2019; Hall & Krueger, 2018; Rosenblat, 2018). At the same time that Uber began to invest in legal and lobbying costs order to secure the political and regulatory foundations for its gig-labor ride-hailing model, the firm also began investing in the development of a fleet of autonomous vehicles: self-driving cars. By early 2015, Uber hired away fifty researchers from Carnegie Mellon University to focus on autonomous vehicle development (Lowensohn, 2015). The US Patent Office records nineteen filed patents related to autonomous vehicles from Uber in 2015 and over fifty in 2016. Upon IPO the company disclosed an increase of funding to these initiatives of 39% between 2016 and 2017, and an additional 25% the following year.

These two cases highlight an unexplored link between two sides of the platform gig econ-

1. https://www.faa.gov/news/updates/?newsId=82225; https://www.federalregister.gov/documents/2019/08/08/2019-17010/petition-for-exemption-summary-of-petition-received-amazon-prime-air. On August 31, 2020, the *New York Times* reported the FAA's issuance of a part 135 air carrier certificate to Amazon for its drone delivery service.

omy: platform coordination of labor, on the one hand, and expansion of automation techniques for said labor on the other.[2] Far from being two separate stories, we argue that the two go hand in hand. This paper unpacks this connection by analyzing an organizational configuration that we call "*pre-automation*." We define pre-automation as *the coincident, strategic effort to scale a workforce and monopolize a distribution network via platform while simultaneously investing in its automated replacement*. While "lean platforms" (Srnicek, 2017)[3] amass ever-larger networks of externalized gig or contract labor forces to scale platform services, we demonstrate that these same firms may simultaneously and concertedly invest in the technologies to replace gig workers with machines of the company's own design. They do so by developing capabilities to automate core services in-house through technologies such as self-driving vehicles and drone-based delivery.

Despite the prominence of automation in the investor-facing strategic communications of firms such as Uber and Amazon, the literatures on gig-labor and platform capitalism have yet to seriously grapple with the existence or implications of this strategic configuration. To be sure, scholars have theorized how platform firms use technology to disrupt the business models of incumbent competitors (Srnicek, 2017), highlighted the role of automated technology as a means of algorithmically controlling the workforce (Brayne & Christin, 2020; Cutolo & Kenney, 2019; Kellogg et al., 2019; Rosenblat, 2018), or documented more generally how automation projects inevitably rely on (often invisible) human labor to step in for what machines cannot do (Gray & Suri, 2019; Sachs, 2020; Shestakofsky, 2017; Shestakofsky & Kelkar, 2020). But the orientation toward automated insourcing of a platform's own presumably core services, and the implications this holds for work, have not been addressed.

Drawing attention to pre-automated work arrangements pushes us to consider platform work and its connections with outsourcing and automation in a more dynamic manner. Viewed statically, platform labor appears as an increasingly expansive model of contingent work that is here to stay (Gray & Suri, 2019; Katz & Krueger, 2016; Ravenelle, 2019; Vallas & Schor, 2020). For the aspiring platform monopoly firms we study, however, we suggest that the current configuration of gig-labor represents neither the strategic end goal nor the imagined "future of work." Rather, it represents a presumed intermediate stage in a larger dynamic of firm-driven industrial transformation, one in which outsourced gig workers are enlisted to construct platforms' market dominance by taking on risk, trial running the system, and staging tasks for subsequent insourcing via automation. This dynamic perspective helps reconcile claims about the monopolistic dominance of platforms that support their astronomically high valuations, with the reality of perennial unprofitability and consistently low margins at companies like Uber or Amazon in their current forms (Molla, 2019).

It is *not* our goal in this paper to make predictions about the future course of platform automation.[4] Rather, our aim is to theorize and document pre-automation as *an imagined future* (Beckert, 2016; Jasanoff & Kim, 2015) which nevertheless shapes *current* arrangements

2. There are many layers of automation in gig economy systems: here we focus on gig-worker replacement.

3. Srnicek's concept of the "lean platform" describes an orientation toward capturing market share instead of producing a sustainable model for profit: scholars of platform monopoly capitalism emphasize that platforms thrive through becoming the dominant player in the market, creating effects that perpetuate and cyclically strengthen the platforms' economic position (Cutolo & Kenney, 2019). The pre-automation configuration describes how platform work that builds out this economically advantageous position is staged for later profitable automation.

4. We agree with the litany of studies of technology in the workplace that argue that humans cannot be fully automated away (Autor, 2015; Brayne & Christin, 2020; Davenport & Kirby, 2016; Ekbia & Nardi, 2017; Gray & Suri, 2019; Kling, 1991; Levy, 2015; Mindell, 2015).

of labor and technology. Studies of capitalism have argued that stories about the future — including wildly unrealistic ones — help to mobilize resources and coordinate projects (Beckert, 2016; Hirschman, 1977). Actors' imagined or projected conceptualizations of the future carry significant social and material weight in present-day decision-making independent of their actual realization (Borup et al., 2006; Brown et al., 2017; Deuten & Rip, 2000; Jasanoff & Kim, 2015), with Beckert arguing that "expectations motivate real decisions that have distributional consequences and may thus become the object of interest struggles among actors in economic fields" (Beckert, 2016, pp. 11–12). Understanding firm-level investments and decisions in the present, therefore, means grappling with anticipatory visions of the future. Intentions to automate core platform functions represent one such premise upon which contemporary labor is organized, capital is invested, particular forms of innovation are incentivized and an infrastructural monopoly is constructed.

We caution that not all "gig-work" platforms are oriented toward automation in the manner we describe, and that not all automation involves a strategic, endogenous component oriented toward market capture. We agree with scholars of the gig economy who argue against generalizing across distinct kinds of platform-enabled work under a single banner (Vallas & Schor, 2020). The two cases we describe, Amazon parcel delivery and Uber taxi services, are both dispersed mobility platforms characterized by complex yet relatively non-customized tasks. These features make them particularly likely targets of platform automation projects.

Our aims in this paper are primarily theoretical. We lay out the concept of pre-automation as a strategic configuration, marshalling available evidence about firm investments, timing of strategic initiatives, and manifestations in labor force data, and focusing on core cases of Uber driving and Amazon delivery services. We theorize the role of platform workers as infrastructural laborers in the pre-automation dynamic, and draw on interviews with workers to investigate their engagement with this process. Overall, this intervention aims to provoke an alternative perspective on the intersection of gig-work, outsourcing and automation in the era of platform monopoly capitalism.

2 Background and Conceptual Development

Sociologists and researchers in proximate fields have produced a growing number of synthetic accounts of how platform-coordinated "gig work" is transforming markets, work, employment, and firms, including an interest in workplace surveillance and its evasion (Levy, 2015; Zuboff, 2018), or the experience of gig workers (Gray & Suri, 2019; Kunda et al., 2002; Neff, 2012; Occhiuto, 2017; Rosenblat, 2018; Schwartz, 2018). Studies of "micro-entrepreneurship" attend to issues such as time-management or flexibility at work, and the use of information technologies to manage these sensibilities (Appelbaum et al., 2006; Mazmanian et al., 2013; Occhiuto, 2017). Meanwhile, economists debate basic questions regarding the scale and consequences of the platform economy, largely due to the difficulty in detecting gig workers through available survey data (Abraham et al., 2018; Collins et al., 2019; Hall & Krueger, 2018; Kalleberg, 2011; Kässi & Lehdonvirta, 2018; Koustas, 2019; Taylor, 2017). Scholars also differ on the extent to which platform-mediated gig work should be conceived of as distinct from other more traditional modes of contract and on-call work (Bernhardt et al., 2016). Applied legal scholarship meanwhile has focused on employment misclassification, and contestation over platform firms' efforts to define their role as intermediary brokers rather than as employers (Dubal, 2017). Overall, existing scholarship treats platform work as an emerging phenomenon investigable in its own right, but does not fully consider observed practices as developments within the larger

arc of platform capitalism (Srnicek, 2017; Zuboff, 2018). Such a focus suggests the need for further consideration of the connections between automation, outsourcing, and gig labor in the strategic projects of aspiring platform monopoly firms.

2.1 Automation from the Inside

Scholars of labor have long considered how machines as engines of capital can deskill workers, reduce employment costs, and heighten profit margins (Brynjolfsson & McAfee, 2011; Kristal & Cohen, 2017; Marx, 2010/1867). For instance, Marxist and neo-Marxist theories of capital's role in labor displacement view firms as adopting newly available technological tools to displace or control the labor process (e.g. Braverman, 1974; see also Kling, 1991). As such, existing accounts of automation typically assume that automating technologies are external to the firm, brought in through a complex process of integration that may or may not align with local political arrangements of tools and skills (Bailey & Leonardi, 2015; Barley, 1996).

Where the pre-automation dynamic differs from traditional conceptions of automation is with respect to both the causal ordering and assumed exogeneity of job-replacing tools. Firms deploying a pre-automation strategy marshal labor to set the stage for their own future automation. In this sense, gig job creation, automation, and job destruction are in-house, endogenous processes, central to the firms' imagined futures as platform monopolists. This same endogeneity means that labor-displacing automation is also a more iterative, protracted process. Adopting a pre-automation strategy, firms may hope to avoid well-known pitfalls of automation, such as a large, one-time capital investment in equipment and skills training, or taking on risk associated with the influx of machinery and shifts in employment relations. The pre-automated work arrangement offers the opportunity to scale services rapidly with lower risk to the firm, and to trial run a service at scale to generate logistics data that inform developing machinery.

The key fulcrum (and scope condition) of this model is the platform monopoly structure. By platform monopoly, we mean a captive distribution system that relies on large network externalities, and is undergirded by culturally-embedded consumer expectations and embodied habits (such as the expectation that one can press a button on one's mobile phone, and a car should appear on the street corner, or a package should appear on one's doorstep). Scholars of platform capitalism describe the rise of this business formation as a significant shift in the political economy of U.S. consumer markets (Srnicek, 2017). Much like the railroad networks of the late nineteenth century (Chandler, 1977), the prospect of capturing monopoly profits underwrites an enormous amount of capital investment aimed at rapidly scaling platforms and consolidating a dominant market position prior to any competitors.[5]

Because the potential rents to be generated from a monopolized, vertically integrated distribution system are so substantial, companies may be willing to devote immense resources (and sustain enormous short- and medium-term losses) in order to scale a platform network. In other words, capturing the externalities upon which the network depends presents the possibility for considerable future return on investment. These investments include not only development of basic service technology (apps and websites), but also the discounting incentives necessary to attract providers and customers, the institutional transformation efforts (political lobbying) necessary to sustain and monopolize the network (Fligstein, 2001) and the research and

5. By the middle of the twentieth century, big vertically integrated corporate enterprises with substantial capital to invest in automating technologies were normalized (Galbraith, 1967). To some extent this dynamic hunt for new monopolistic networks is at odds with older currents of Marxian political economy which equate monopolism with stagnation and lack of innovation (Baran & Sweezy, 1966).

development which will eventually allow the firm to capture a greater share of the rents from the network by displacing high-marginal cost gig providers with low-marginal cost insourced technology. Indeed it is perhaps only with the rise of platform monopolies as a business model that it makes plausible sense for a firm to develop a workforce and invest in an infrastructural network that it intends to self-disrupt as soon as possible.

In some cases the promise of automated technology plays a role in firms' efforts to solidify a platform's dominant market position. For instance, network externalities for ride-hailing and other localized gig services are known to be asymptotic and unstable due to the ease with which providers can switch between competing apps. This results in low barriers to entry for competing platforms. In contrast, captive automated vehicles cannot defect to a different platform. Hence Uber founder and first CEO's Travis Kalanick's 2016 assertion that winning the race to roll out automated vehicles was "existential" for Uber's viability as a business (Chafkin, 2016). Rather than see gig workers as compensating for automated technologies' incompleteness ex post (Gray & Suri, 2019), we argue that the deployment of gig labor is a purposive staging effort aimed at building an automated system while scaling a service, shifting the regulatory marketplace, generating capital, and enabling platform monopoly.

2.2 Outsourcing First, Then Insourcing

The pre-automation concept also points to an underappreciated function of outsourcing in twenty-first century platform capitalism. Outsourcing typically refers to the externalization of task functions which had once been performed internally. According to Dey, Houseman and Polivka (2010), firms outsource their internal functions for various reasons, including: 1) vertical disintegration and the emergence of complex forms of networked production; 2) removal of back-office functions to low-cost environments; 3) transformation of employment relationships by contracting on-site services to third-party contract firms (including temporary workers), which allows firms to reduce employee benefit expenses, circumvent pay compression norms, and displace unionized workforces; 4) changing managerial conceptions, which emphasize flexibility, focusing on core competencies, and reducing firms' internal administrative burdens (Dey et al., 2010). Economic sociologists generally agree that this form of outsourcing has become more prevalent in the U.S. economy since the 1970s, reversing a prior century-long trend toward ever-more internalized bureaucratic administration (Abraham, 1990; Bernhardt et al., 2016; Davis-Blake & Broschak, 2009; DiTomaso, 2001; Weil, 2014). On a structural level, the number of distinct business entities has grown at a significantly faster rate than the overall workforce (Meyer, 2001, p. 464), resulting in more external contracting and external coordination. At an organizational level, outsourcing appears as part and parcel of broader transformations in corporate bureaucracies and the rise of precarious employment relationships (Cappelli, 1999; Kalleberg, 2011; Weil, 2014). This transformation has the effect of offloading risk from firms onto individual contingent workers and/or the smaller sub-contractors who employ them (Irani, 2015; Neff, 2012; Weil, 2014).[6]

The rapid growth of algorithmically-managed platform "gig" work appears to represent the culmination of outsourcing and contracting trends *in extremis*. But while outsourcing had traditionally been viewed as primarily affecting firms' auxiliary activities and inputs,[7] contem-

6. These are conceptually distinct insofar as outsourcing refers to the boundaries of firms, whereas contract work refers to employment relations between firms and workers. For instance, a firm could outsource a task to a supplier whose workers themselves are traditional full-time employees.

7. Gray and Suri (2019) argue that by the 1990's, firms classified various forms of work as "core competencies"

porary platforms go a step further in *externalizing provision of the firm's core task functions*. For example, rather than hiring a third-party transportation services firm to supply a pool of taxis and drivers, platform ride-sharing companies use a web-based app to separately contract each discrete job with an individual worker-contractor, positioned as a "micro-entrepreneur."

Platforms also offer a novel business motive for outsourcing. Although firms pursuing pre-automation aim ultimately to reduce marginal labor costs by replacing human service providers with firm-owned automated technologies, they are at least initially primarily interested in building up market power, which takes the circuitous route of outsourcing labor. As we elaborate, outsourced gig-labor is useful to the company in this early phase to externalize costs and risks associated with scaling the platform network: scaling which justifies costly concurrent investments in automation. We therefore add to Dey et al.'s list of outsourcing rationales: *Outsourcing as a staging opportunity for bringing automatable work in-house*.

Locating automation efforts internally to the firm and observing this rationale for outsourcing suggests skepticism of the assumption that current forms of platform-mediated gig labor represent some kind of stasis point or end-strategy for platform firms. Gig work is an emerging and dynamic phenomenon, and among its dynamisms we must consider current observed practices as developments within the larger arc of platform capitalism. As we describe below, reconstruction of key firms' investments reveals that current forms of algorithmically-managed gig work are conceived as a prelude to an automated distribution network in which today's gig workers are rendered redundant through the firm's development and deployment of in-house technology. For this reason, we look beyond the current organization and experience of gig work to consider how companies strategically deploy a particular form of labor externalization to pave the way for monopolized, automated, imagined distribution systems. In our view, what is most novel about platform-mediated outsourcing is not the precarious or technologically-imbricated form of labor (this also accompanied industrialization: see Gray & Suri, 2019); but the role that this externalized workforce plays in facilitating an expansionist business strategy specific to platform monopoly capitalism (Srnicek, 2017).

3 Pre-Automation in Action: Two Case Studies

3.1 Example #1: Amazon Prime Air, Flex, and DSP

The timeline in Figure 1 maps the scaling of the outsourced gig workforce associated with Amazon delivery including Prime Now, Flex, and the Delivery Services Partnership program, alongside a parallel effort within the company to develop the core automation techniques for worker replacement. In the absence of data on internal deliberations, we reconstruct firms' strategic orientation from public patent records (compare to Delfanti & Frey, 2020), investment and acquisition histories recorded on an industry-standard database (www.crunchbase.com), and records of series-specific funding rounds, lobbying activities, and other general announcements available in the technology press.[8] The left side of the timeline shows the expansion and evolu-

versus auxiliary at will in order to protect their ability to selectively outsource, as in Vizcaino v. Microsoft Corp., 120 F.3d 1006 (9th Cir. 1997).

8. We were unable to interview or visit employees of these firms, which are famously closed to outsiders, and therefore could not access direct statements of corporate strategy. However, interviews with elite members of each organization were unlikely to shine much insight upon business practices as such individuals are practiced at controlled conversation with outsiders. We therefore worked through indirect means to access necessary information, relying on trace data in public records to piece together strategic direction.

tion of Amazon's last-mile delivery system into an increasingly captive platform-based model, while the right side documents concurrent investment in research, development, or acquisitions associated with a fully automated version of the same service (Figure 1). While a company the size of Amazon may often undertake multiple simultaneous and unrelated ventures, we argue that these parallel and intertwined corporate activities suggest a pre-automated strategy in action.

Amazon's Last-Mile Programs	Year	Amazon's R&D and acquisitions
	2013	December: CEO announces drone delivery development on *60 Minutes*
Summer: Prime Now program idea October: Amazon buys warehouse space on 34th street in Manhattan December: Prime Now service begins in NYC	**2014**	CEO begins Prime Air internal dvision Spring: Amazon applies for first drone delivery patents July-December: 30 patents filed for drone delivery technologies over 6 months
Prime Now expands across Manhattan September: Begins Flex platform for driving delivery services	**2015**	94 patents for autonomous aerial vehicles filed.
California classifies Prime Now drivers as employees	**2016**	95 patents for autonomous aerial vehicles; 16 submitted for autonomous vehicles.
Flex rolled out to 11 US cities	**2017**	Acquires Dispatch.AI and Scout robot (founded in 2014) Begins Amazon Vehicles division Additional 95 patents submitted for drone delivery; 12 for autonomous vehicles.
Amazon begins Delivery Services Partnership Program (DSP) in Q2	**2018**	December: Announces drone delivery "within months"
Amazon incentivizes employees to start their own DSP franchise	**2019**	Senior VP placed in charge of both DSP and autonomous vehicle division

Figure 1: Parallel timelines for development of automated services and Prime Now, Flex, and DSP. Sources: LexisNexus, US Patent Database, TechCrunch, WSJ

The idea for the two-hour Prime Now delivery service emerged in the summer of 2014 (Kantor & Streitfeld, 2015), mere months after Jeff Bezos announced in an interview on 60 Minutes that the company was working on drone delivery technologies.[9] Within weeks of initiating its dedicated drone delivery unit, Amazon purchased a warehouse in central Manhattan to stage the deployment of Prime Now's rapid delivery service. Amazon repeated this pattern in September 2015 with Flex, a client-side platform to meet demand for same-day delivery outside of Manhattan, where individuals signed up to deliver packages by car within a given metropolitan area. Throughout 2017, while Amazon expanded Flex to eleven US cities and advertised for new drivers, the company also purchased Dispatch.AI and its mobile delivery robot, Scout, founded a subsidiary called Amazon Vehicles, and began patenting in autonomous vehicle and delivery services for last-mile deliveries.

In the latter half of 2018, Amazon rolled out its delivery services partnership program (DSP), relying on an exclusive franchisee network of micro-entrepreneurial small businesses to deliver packages. Instead of signing up to drive via Flex, an individual could found a small business that employs other drivers and bears the capital costs for a fleet of 10-40 vans. Like

9. https://www.cbsnews.com/news/amazons-jeff-bezos-looks-to-the-future/. Accessed December 3, 2020.

Uber, which provides financing for individuals to lease vehicles for the ride share program, DSP also provides incentives for van leasing and back-office support for these local delivery startups. Deliveries are coordinated algorithmically, via an Amazon smartphone app used by every driver, thus ensuring Amazon manages the delivery logistics and retains control of the data while avoiding the burdens of workforce management and vehicle maintenance. Rollout of this service also coincided with fresh investment in autonomous vehicles and trucks for last mile delivery services. The DSP and Amazon's automated vehicle delivery programs were not separate initiatives: by 2019, the same executive, Senior Vice President Dave Clark, was running both programs, and Amazon was offering its employees financial incentives to quit and start their own DSP franchise (Berger, 2019).

Examining patents filed by Amazon during this period reveals that these announcements reflected a series of sustained investments into this technology. Automation efforts in the Prime Air drone division began on a small scale in 2014 while the Prime Now service rolled out in Manhattan, growing steadily over time with individual and small team hires. Although they purchased a few small robotic delivery companies, the company largely scaled up their in-house automation division through strategic hires directed at developing automated last mile delivery internally. Patent data not only reveals *what* a company is working on but also *who* is working on these problems: associating LinkedIn profiles with patentor names indicates that individuals who joined Prime Air and Amazon Vehicles were hired from other Seattle-based technology companies such as Intel or Microsoft, or west coast aerospace such as Boeing or the Jet Propulsion Laboratory; they moved on from their time at Amazon to robotics, logistics, or automation-oriented companies, perhaps due to the expertise they developed at Amazon. We also observed that many of the project teams associated with Prime Air contributed early patents as anchor tenants for the new automated vehicles unit, officially founded in 2017 but with an earlier patenting record. Taken together, all automated delivery service patenting grew to approximately 7% of approved patents throughout the Prime Now and Flex roll-out period of 2014–2017 (Figure 2).

Patents serve many purposes within a corporation, but it is suggestive to read this evidence of steady growth of investment in automation in the context of Amazon's experimentation with a variety of in-house and out-of-house delivery options throughout the 2010's. For instance, Amazon attempted to work through UPS and USPS exclusively instead of via FedEx, purchased their own fleet of airplanes (in a different, prior iteration of "Prime Air"), and experimented with their own delivery vans and long-haul trucks. In the public press these configurations were framed as an attempt to "solve the problem of last mile delivery," as if this problem were merely technical and logistical. The preferred solution to this problem involved altering the relational architecture of the market (Fligstein, 2001) by progressively cutting out third party delivery firms. The expansion of Flex, Prime Now, and later DSP as well as parallel investments in drone and automated delivery together aim to "solve" Amazon's problem of last mile delivery with logistics applications owned by the company.[10] Amazon already operated heavily automated warehouses and possessed the expertise in robotics, logistics, and flexible work arrangements — in addition to the substantial capital — necessary for investment in research and development. Prime Now and Flex, in their initial articulation and pre-automated arrangements, therefore drew on existing trends toward automation, contract labor, and logistics within the company to initiate a form of industry capture.

Investment in developing these technologies also took place alongside an explosive growth

10. A form of "closure by redefinition of the problem" (Pinch & Bijker, 1987).

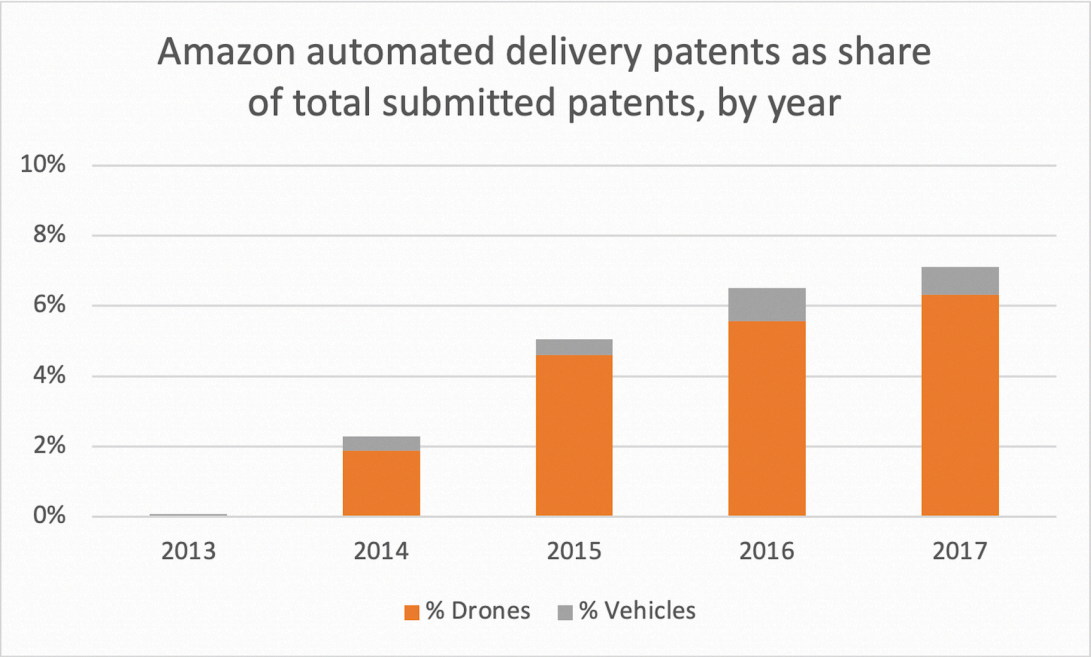

Figure 2: Automated delivery patents as share of total Amazon patents submitted, by year

of workers in this sector. The impact of Prime Now and Flex is difficult to discern due to the low visibility of workers in public records, but DSP "startups" are sub-contracted franchise establishments with statutory employees, making the impact of Amazon's DSP program discernable in industry data. We therefore drew on the Quarterly Census of Employment and Wages (QCEW) from the Bureau of Labor Statistics[11] to plot trends (2015–2019 Q2) in the number of establishments, total employment, and average weekly wages in the delivery-driving industry. Before 2017, we witnessed steadily increasing consolidation and centralization in the delivery services industry as existing companies scaled up to deliver growing numbers of packages for e-commerce behemoths like Amazon. The reversal of this trend in the number of delivery establishments just after the DSP launch in the third quarter of 2018 is striking (Figure 3). The QCEW data show a net estimated increase of approximately 1,500 establishments from the launch of DSP in late 2018 through the first quarter of 2020. Not all of these are Amazon partners, of course, although the change is comparable to the 1,300 startup businesses which Amazon claims to have spawned through the second quarter of 2020.[12] The total number of persons employed as delivery drivers was already on the rise before the introduction of DSP due to the secular growth of e-commerce, but the DSP rollout may have accelerated this trend based on the third quarter uptick in 2018. The number of delivery drivers doubled to over 100,000 by Q2-2019 (Figure 4). The introduction of the DSP program therefore tells a story of initial consolidation in an employment market, then rapid expansion of an employment opportunity alongside a distribution network. We suggest that such simultaneous scaling of a platform, labor capture via gig work, and investment in automation technologies are complementary activities in a pre-automation strategy.

11. https://www.bls.gov/cew/downloadable-data-files.htm

12. http://www.aboutamazon.com/news/transportation/two-years-of-empowering-entrepreneurs-with-more-to-come

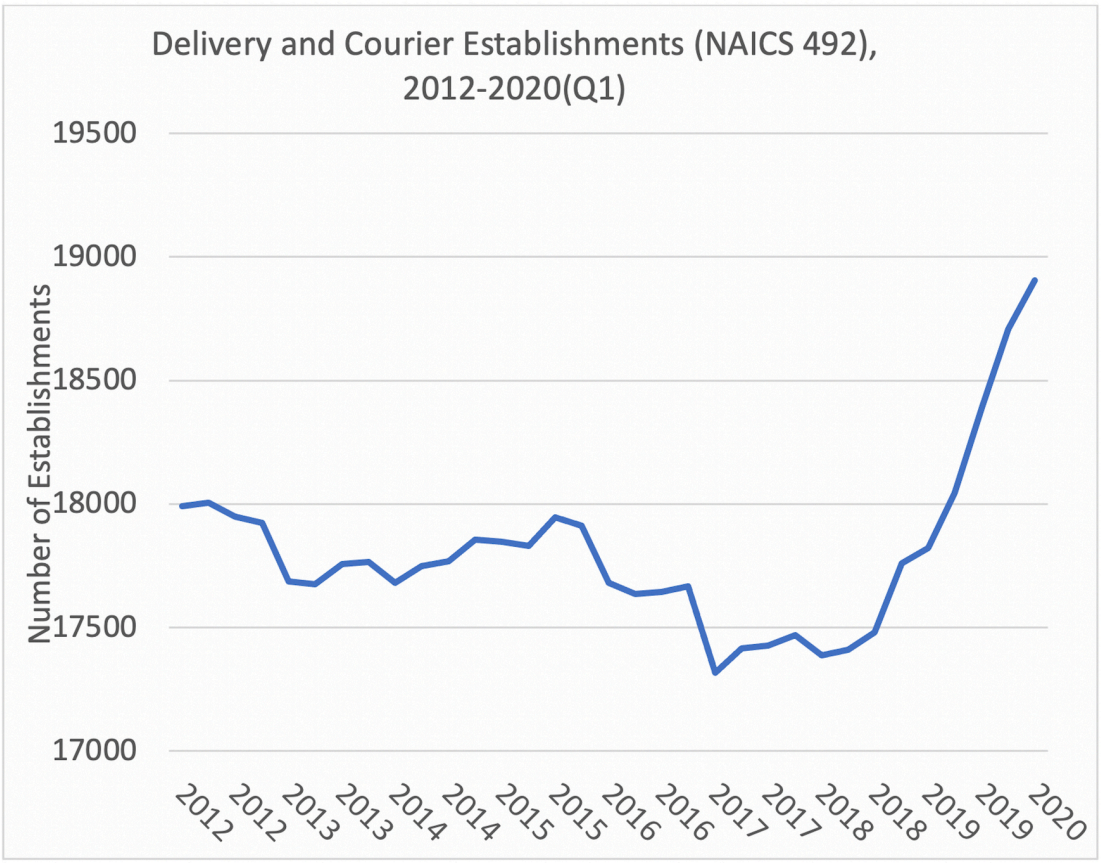

Figure 3: Trend in total number of parcel delivery establishments nationally, 2012–2020. Data come from Quarterly Census of Employment and Wages. Consolidation reverses in mid-2018, with the launch of Amazon DSP franchise program.

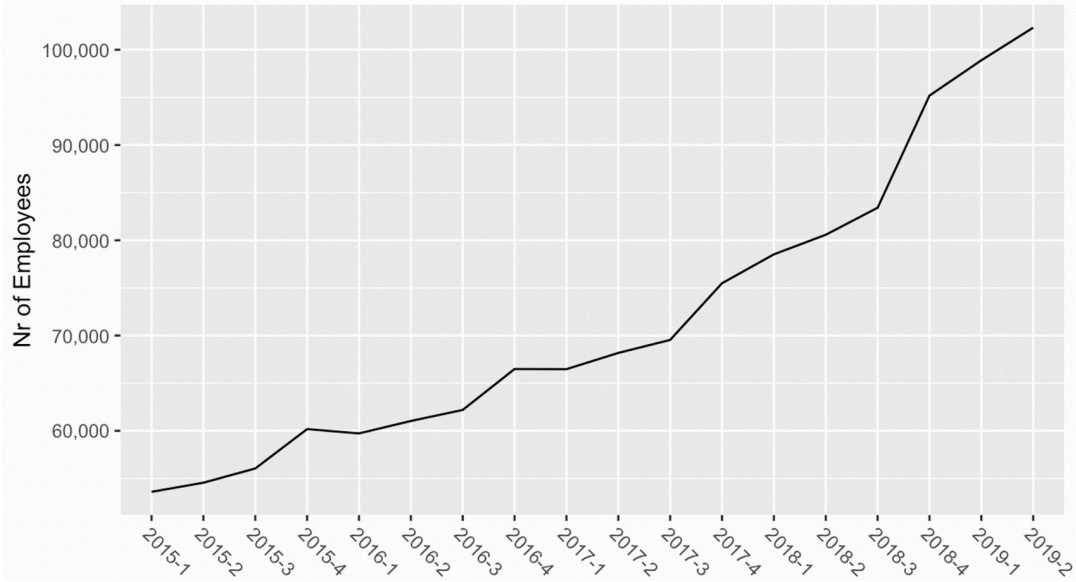

Figure 4: Trend in total number of statutory employees in parcel delivery industry nationally, 2015–2019. Data from Quarterly Census of Employment and Wages, 2015–2019.

3.2 Example #2: Uber Technologies

Amazon already possessed considerable capital at the outset of its automated delivery development and had the resources to initiate concerted research efforts in automation at the same time as introducing and scaling a new gig service. Uber, meanwhile, took an *acquisitive approach*, displaying a strategic pattern of growth and corporate acquisitions that guaranteed both employee expertise and the transfer of existing patents.[13] Despite its founder's early professed interest in producing self-driving vehicles, for the first few years of the company's existence the company made no direct investments in developing this technology. By 2014 the startup had enough initial success and access to capital to invest strategically in the acquisition of automating talent and expertise. In early 2015, the company hired fifty autonomous vehicle researchers from Carnegie Mellon University, followed by the purchase of Otto the following year. This included experts and patents filed from 2013 onward about lidar (light detection and ranging), sensing technologies essential for an automated vehicle to detect and analyze distance from obstacles and other vehicles. As efforts on the gig economy platform scale, investments in automation scale too, with research and development growing accordingly (Figure 5). Uber's patent holdings demonstrate considerable commitment to this project: by 2017, over 40% of their total approved, purchased and acquired patents were dedicated to autonomous vehicles, including half of all patents filed in 2017 (Figure 2). We observed that the acquired groups generated a stable patenting infrastructure for Uber's ongoing efforts and were still visible as

13. Pre-automating companies do not necessarily need to make space internally for simultaneous development of automated technologies. Lyft, for instance, followed up on their CEO's public discussion of automated vehicles in 2012 with an official partnership with Ford's automated vehicle unit, much like the partnerships Uber and Amazon announced with external firms at the close of 2020. Hybrid arrangements are also possible, with Amazon's acquisition of Zoox in summer 2020 following Uber's acquisition-oriented strategy. Future work should examine strategies companies deploy to maintain their core gig-economy business while scaling the automating aspect of their service as finances permit.

enduring clusters several years later, with LinkedIn profiles revealing little firm attrition.

Uber service expansion	Year	Uber automation efforts
Uber expands to Europe Taxi drivers strike in France, app banned in Germany, California cities sue	**2013**	
Uber-pooling introduced Public outrage over surge pricing	**2014**	May: CEO publicly describes intention to introduce self-driving vehicles
Enters agreements with cities for passenger data sharing Adds 50,000 drivers	**2015**	January: hires 50 roboticists from CMU; self driving car tests begin in Pittsburgh 18 autonomous vehicle patents filed in 2015
Waymo-Google-Uber battle over autonomous vehicle patents	**2016**	Acquires Otto, self-driving truck company, and patents dating back to 2013 September: begins automated vehicle tests in San Francisco $230 million reported investment in self-driving vehicle research. 51 patents approved patents submitted
CEO steps aside, promises "Steve Jobs moment" Drivers agitate toward unionization and benefits	**2017**	$384 million invested in self-driving vehicles; 75 approved patents submitted. Website up for Advanced Technologies Group (self-driving vehicles unit) Funding from Toyota in corporate round

Figure 5: Parallel timelines for Uber service roll-out alongside car automation efforts. Sources: LexisNexis, US Patent Database, Crunchbase.com, Uber Technologies Inc. S-1 Registration Statement.

If Amazon's pre-automation narrative is one of vertical integration and industry capture, Uber's is a story about acquisition and investment. Although its CEO stated interest in self-driving cars earlier, Uber began its automated efforts once the platform had suitably expanded and investment levels were high. It was late to acquire its first self-driving car patents (by then, companies like Microsoft, Google, Apple, Ford and Toyota had already invested millions) and records of successive years of patenting are largely due to its strategic acquisitions of people, companies, and patent holdings (Figure 6).[14] Uber's IPO documentation filed in early 2019 lists approximately 30% R&D investment oriented toward self-driving vehicles between 2016–2018, with $457 million dedicated in 2018 alone, supporting its claim that "autonomous vehicles will be an important part of our offering over the long term" (Uber Technologies, 2019, p. 33). Including the cost of acquisitions, it is estimated that Uber spent nearly $1 billion on research and development of automated vehicles from 2015–2020 (Harris, 2019). Consider-

14. Uber's patent acquisition strategies, including the creation of the corporate entity Apparate, became more widely known following a high profile lawsuit with Google Waymo over the 2013–4 patents.

able shareholder capital is therefore bet on the assumption that an eventual automated system will eliminate or at least reduce the marginal labor costs of human-driven service delivery, with patent capture providing additional revenue along the way.[15]

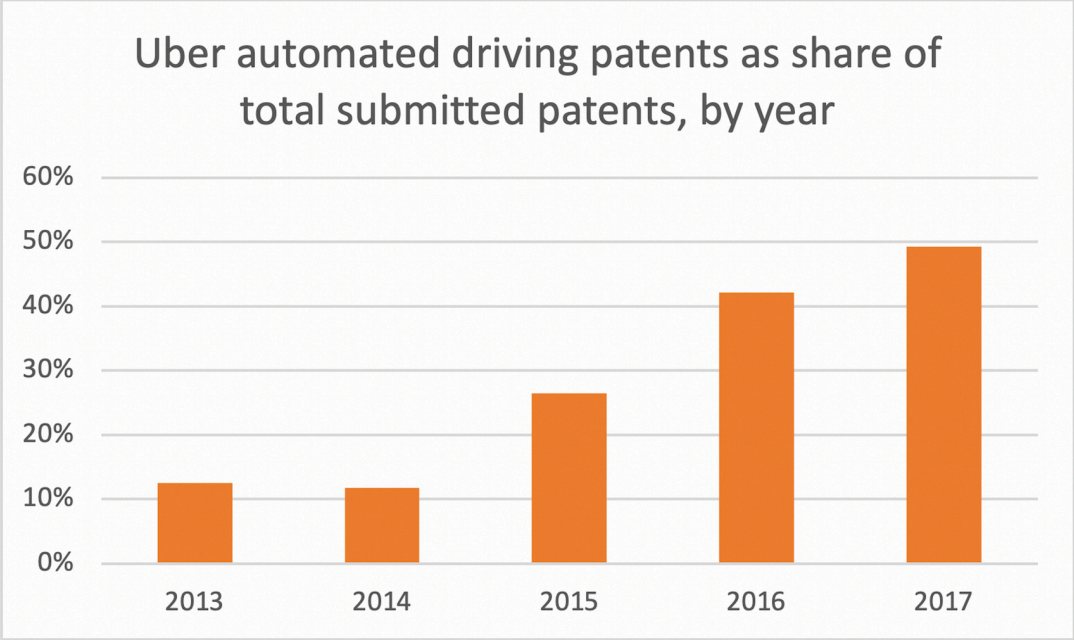

Figure 6: Automated delivery patents as share of total Uber patents, by year submitted. All 2013–2014 patents were acquired.

Such data suggests that Uber's excessive valuation during this period was not only premised on its global expansion, but also upon its ability to eventually automate and insource its core "sharing" service: driving. Self-driving cars were seen as expensive to develop relative to low prospective revenue in early direct-to-consumer sales, requiring the kind of capital for research and development that could only be offset by such established companies. Uber's strategy aimed to guarantee prospective sales not by selling cars to consumers, but by introducing automated vehicles to *cities* as a mode of taxi transport. Although exaggerated promissory narratives about future technological plans are often used for strategic purposes to raise capital, we note that Uber's own 2016 internal projections for AV taxi rollout ranged from between 13,000-75,000 cars by 2019.[16] In the meanwhile, their "disrupting" online sharing platform dismantled the existing taxi infrastructure in those cities, paving the way for the hoped-for, eventual

15. Compare to Viscelli on automated trucking (Viscelli, 2018). Additionally, a recent paper by Delfanti and Frey argues that Amazon patents demonstrate a more synergistic human-robot future, whereby human labor is assisted through machinic devices (2020). This may be the case in warehouse work, but our study points in a different direction, wherein this synergism is an intermediate stage toward the intended full mechanization of work. As these assistive patents describe and circumscribe human labor in increasingly mechanical terms, they stage such labor for eventual takeover. Reading patents as evidence of sociotechnical imaginaries, successive staged futures are made visible in documentation of anticipatory technologies, themselves anticipated in stepwise fashion (compare to Messeri & Vertesi, 2015).

16. These internal presentations later became public in the context of an intellectual property lawsuit. See p. 22 in https://www.documentcloud.org/documents/5765440-2275-4-Uber-Bratic-Report-EXCELLENT.html. Accessed December 20, 2020.

insertion of the company's own automated vehicles.

As with last-mile delivery, suggestive traces of this pre-automation strategy are apparent in labor market data for the taxi industry. Unlike the DSP, these companies do not encourage individuals to start their own businesses, so the numbers of new drivers who work exclusively for ride-sharing services are difficult to quantify. Instead, we looked at mean weekly wages at the industry level, where we noted a staggering increase. Between 2015–2019 average wages in the taxi and limo sector rise from around $500 weekly to a peak of nearly $1700 per week (Figure 7). We postulate that these increases were not driven by the dwindling number of traditional taxi drivers, but rather reflect the *rapid compositional replacement* of taxi drivers with an influx of tech workers who are developing the applications for ride-sharing and the automated technologies for driver replacement. Such wages are not out of place in computer or information technology sectors, but as these employees apply their skills to other industries in an effort to "disrupt" markets, they may leave similar empirically observable residue in wage trend data.[17]

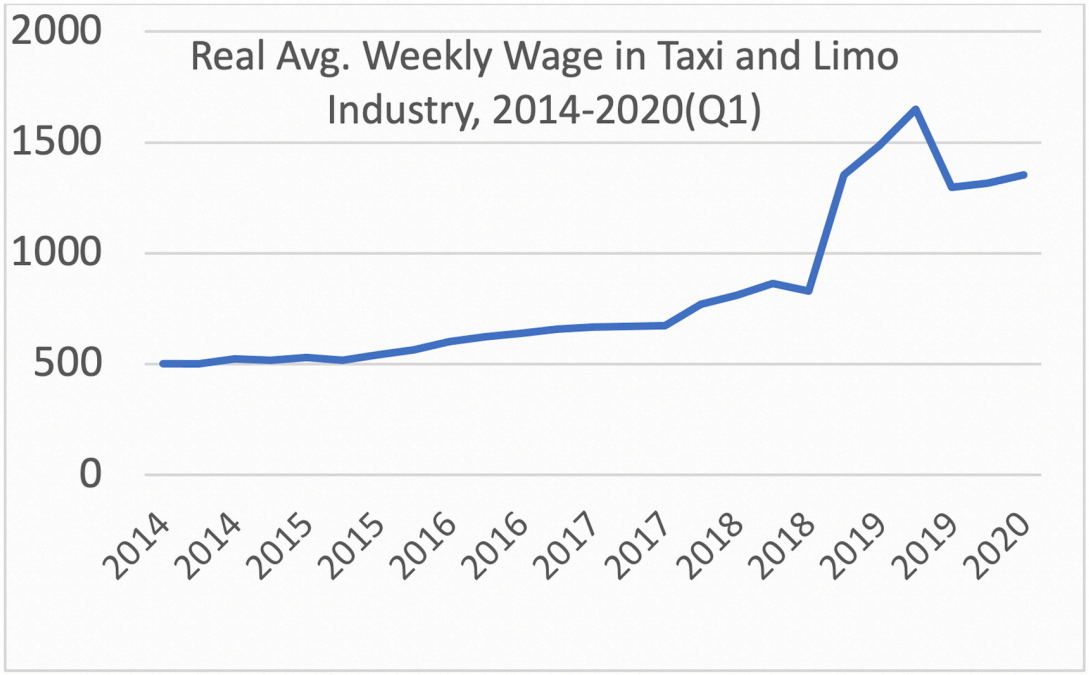

Figure 7: Trend in real average weekly wage among employees in the taxi and limousine industry, 2014–2020. Data from Quarterly Census of Employment and Wages, 2015–2020. Tripling of wages suggests influx of high-salaried technology jobs, a potential signal of a pre-automated strategy in action.

4 What Do Pre-Automated Workforces Do?

Above we provided snapshots of pre-automation processes in action as associated with the development and strategic configuration of two prominent aspiring platform monopoly firms. Here we elaborate specific theorized functions of workers within these pre-automated platforms as distinct from other types of platform gig work and as oriented toward monopolization efforts. From this perspective, platform gig workers can be seen as *infrastructural laborers*

17. Unfortunately, occupation-by-industry tabulations are not available in the QCEW.

rather than just outsourced service providers responsible for revenue generation. We propose that preautomated laborers build out the infrastructure for aspiring platform monopolies in three key ways: (1) scale the network and establish consumer demand; (2) take on corporate risks as individualized risks under the frame of micro-entrepreneurship; and (3) trial-run logistics for tasks that are intended to return in-house in automated form. Given only indirect data, we offer the following as speculative propositions, which we complement with data from forty-one structured interviews with contract employees of pre-automating firms (20 with Amazon workers, 21 with Uber or Lyft drivers).[18]

Scale the System. We theorize that the first-order infrastructural function that pre-automated workers perform on behalf of the aspiring firm is helping to scale the network. Scale is the watchword of platform economics, especially for "lean platforms" which emphasize network construction and coordination (Srnicek, 2017). Through independent registrations, workers build platform service-delivery into city- or nation-wide infrastructure: the increase in human-powered service providers visible in Figure 3 and Figure 4 provide evidence of such growth. As the system grows, so does the user base and demand from those users. With every Flex delivery, Flex drivers help Amazon gain one more customer who is accustomed to having access to same-day package or grocery delivery. As the system scales, too, both customers and gig workers argue for the rollback of regulation that impedes continued service delivery. Legal battles over such propositions are well documented in the press; on Facebook groups dedicated to drivers, we noted considerable pushback against regulation or unionization of gig jobs as drivers feared this would lead to job loss. Infrastructural laborers may therefore themselves serve as frontline deregulators for automated services. Scaling the network helps to establish the captive consumer demand and the network externalities that both support and justify firms' enormous investments in automated technologies to replace such labor. The priority of network scaling at low cost is synergistic with such firms' reticence to classify workers as employees, thereby reducing overhead.

Take on Corporate Risk. We theorize that pre-automation externalizes the *cost* of expanding the network onto gig workers, as well as the *risks* of soon to be obsolete capital investments, through leveraging the contractual relationship common to gig work. By suggesting individuals invest in a vehicle to drive for Uber or purchase a small fleet of vans to deliver for Amazon, companies offload the capital investments associated with growth and scale onto micro-workers, while ensuring they do not sink money into soon-to-be-replaced technologies. The gig workers we spoke to described a variety of these investments, from smartphones to vehicles, as well as the creative techniques they used to maintain profitability despite investment risk: for instance, by planning when to complete their required hours of driving or, in the case of one PhD-holding driver we spoke to, maintaining complex spreadsheets to decide which jobs were profitable enough to accept. We posit that requiring gig workers to invest in and manage these technologies under the framework of "being your own boss" allows the platform firm to focus their own investments in the technologies that will allow them to capture the full poten-

18. We recruited delivery drivers and couriers via flier and Craigslist postings in Queens, Manhattan and in Central New Jersey; advertised on a national website that helps low-income workers manage their benefits; and joined Facebook groups for Amazon Flex Drivers. We therefore spoke to individuals located across the United States but primarily in lower SES conditions. Interviews took between 20-60 minutes and interviewees were remunerated for their time. Anonymity was preserved at all levels of the process: in Amazon's case, at least, the repercussions for those who speak to outsiders about their work are reportedly swift and decisive. Transcribed responses were compared with respect to specific questions, and we also developed and applied an open inductive coding schema based on responses. Complete analysis of findings are under development in a separate paper; we report only on findings relevant to industry automation here.

tial rents of that network in an automated future. Meanwhile independent drivers and small business contractors construct the network on their behalf.

Train, Trial and Taskify. We theorize that pre-automated platform workers may help pave the way for task automation by trial running a scriptable and predictable system. Prior studies of work with algorithms demonstrates the role of human labor in training machines to recognize elements in a dataset (Gray & Suri, 2019; Roberts, 2019; Sachs, 2020); scholars identify how this work is dynamic and shifting because as the algorithms learn from behavior, data becomes more structured (Kellogg et al., 2019; Seaver, 2019). Certainly workers using these platforms transit task-level data to the firm, including patterns associated with demand, delivery routes, obstacles, and timings, providing ample data to refine or improve a model. Yet tasks are also made routinizable and optimizable and therefore automatable through an engineering view of the problem of driving or delivery. Workers we spoke to reported constant system upgrades where they could sense the presence of engineers attempting to script or "improve" their work. For instance, an Amazon Flex driver described new numbering schemes for packages that made sense to a machine but were impractical and difficult to decode as they organized packages in their cars to deliver in their neighborhood. Workers like these often recorded completing the task recommended by the app while following their own methods instead, and used such stories about the non-driving related aspects of their work to assert that it was impossible for a machine to do the job (Stark, 1980). While prior scholarship frames such algorithmic efforts and resistances in the context of employers' attempts to control the labor process (e.g. Levy, 2015; Rosenblat, 2018), we suggest these developments may ultimately be oriented toward making platform workers' tasks compatible with the development needs of engineers (Stark, 1980), therefore better enabling eventual automation.

Casting certain forms of gig work as infrastructural labor can help to distinguish pre-automated arrangements from other studied forms of platform labor. For instance, Gray and Suri (2019) describe the hidden human work in seemingly-automated platforms as "ghost work," explaining its rise and precarity as endemic to the inherent and historically persistent difficulties associated with replacing human labor with machines: what they identify as "the paradox of automation's last mile." The insertion of human laborers in a system rollout recalls a common design technique in engineering, "the Wizard of Oz" technique, in which usability experts trial-run systems using people to understand how users might react to such a system were it to be implemented (Dahlbäck et al., 1993; Kelley, 2018; Wang et al., 2017).[19] In contrast, pre-automated arrangements are not a response to technical limitations, but rather a strategic and purposive arrangement of people and machines that capitalizes upon the infrastructural efforts of highly visible human workers on the front lines to develop the automated service "behind the curtain." Precarity arises as workers are poised to lay the infrastructural, social and economic foundation for their own eventual automation. This also clarifies which companies are emphatically not automating their core functions. For instance, TaskRabbit, Fiverr, or AirBnB invest in algorithms to produce matches between clients and workers, but the services that gig workers on the platform provide are not (yet) being actively scripted or prepared for automation: owners and guests are even rated on their interactional qualities. Not all gig work is pre-automated: pre-automation techniques form only one variety of a broad taxonomy of platform coordinated labor (Vallas & Schor, 2020).

The arm's length relationship offered by outsourcing produces a divergence in narratives

19. The name refers to a scene in American children's author L. Frank Baum's book in which protagonist Dorothy discovers that what appears to be a "great and powerful wizard" is really a small man behind a curtain pulling a puppet's strings.

about the future of such work among gig workers themselves. Our interviews suggest that gig workers are largely marshaled into the automation project unwittingly, and even dissociate themselves from their future at the company with automated cars driving alongside them. We discovered this dissociation when, after several detailed questions about their jobs and daily routines, we asked, "Do you worry about self-driving cars?" The majority of the respondents paused and changed their tone, answering as if we were asking them if they wanted to own such a vehicle themselves. "Self-driving cars? I'm not worried about that," said one, launching into a discussion of the vehicles' safety records as if they were thinking about buying one. Another expressed a similar interest, saying, "it's always good to try new things." Respondents also answered in the position of a customer or driver who might be "in one of those"' and not in the position of job loss. Only two of our respondents identified pre-automative goals, explaining in expletive-laden terms that their parent companies were "greedy" and uncaring about people. Notably, unstable earnings and schedules were the norm for many of the workers we spoke to, who framed gig work as something they expected would be temporary before they were forced to find other work. Concerned with a need to make today's ends meet, these respondents framed the possibility of automation as yet another economic future that would not include them, using phrases like "times are changing" and "anything could change at any moment" that underlined their sense of precarity.

Workers' relative inattentiveness to the spectre of task automation stands in contrast to prior research which finds that gig workers are highly attuned to other aspects of platform firms' strategies, particularly with respect to algorithmic management (Rosenblat, 2018). We posit that workers' distance from and skepticism of the firm's automation narrative may therefore be a product of the very arm's length relationship that firms adopt in their efforts toward automation. It may also explain why prior studies that focus on gig workers have avoided the connection between automation and firm monopoly strategy: the workers don't see it (both intentionally and unintentionally) or, in line with research in the sociologies of the future, they contest its very possibility (Beckert, 2016; Brown et al., 2017).

5 Conclusion

This article has identified an alternative way to think about the platform economy, premised on the detection of strategies that suggest new implications for our understanding of the dynamics of automation, outsourcing, and labor displacement. Of course, the use of low-wage labor to midwife automation projects is endemic across Silicon Valley. We suggest that in the development of certain platforms at least, gig labor is not merely attractive as a reaction to technical challenges associated with the inevitable limits of automation. Rather, we tell a story about a purposive deployment of human workers to scale a platform network as part of a business model that attempts to realize a platform monopoly's full rent-generating potential. Evidence for the mechanics remain suggestive; we therefore offer pre-automation as a topic for further elaboration by sociologists and historians of this period in the expansion of the platform economy, especially as firm-internal documentation becomes available for analysis.

In developing this account, we have sought to take the promissory narratives of automation's apostles seriously without taking them literally as empirical predictions. We agree with scholars in technology studies who cast doubt on the viability of techno-utopian visions and suggest that the receding horizon of automation's cutting edge will continue to require armies of human workers (Gray & Suri, 2019; Shestakofsky, 2017; Viscelli, 2018). Indeed, both of the corporate projects sketched in the timelines above have faced significant delay and even di-

version. With investor confidence riled by claims of harassment, toxicity, and a patent lawsuit, Uber brought in a new CEO who avowed drivers as core to their business and expressed an interest in hybrid autonomy. Shortly before this article went to press, both Uber and Amazon partially divested themselves of their automated divisions, citing a more protracted development process than expected. Of course, economic sociologists document how companies make dynamic choices between futures-in-the-balance when they find themselves in moments of economic uncertainty, not due to the inability to deliver on technologies associated with future claims (Beckert & Bronk, 2018; Kaplan & Orlikowski, 2013). We should therefore expect to see the economic destabilization due to Covid19 to prompt pre-automating companies to keep their strategic options open, as in Amazon's November 2020 decision to outsource their drone development ("Amazon Lays off Dozens of Employees at Drone Programme," 2020), Uber's December 2020 sale of its pre-automated vehicle division while maintaining a 23% stake and board seat for their CEO (Bursztynsky, 2020), and even Amazon's fresh step into the self-driving vehicles market with a fleet produced by acquired company Zoox. Such developments are consistent with a large literature that documents both firms' responses to uncertainty and the near universality with which automation efforts are messy, non-linear, and even deflected (Barley, 1996; Burawoy, 1979; Kellogg, 2009; Kling, 1991; Lei, forthcoming; Sellen & Harper, 2003; Volkoff et al., 2007).

Nonetheless, we believe that identifying pre-automation as a strategic configuration helps to highlight key developmental features of platform monopoly capitalism. First, pre-automated work arrangements point to a distinctive rationale for outsourcing within key segments of the platform economy. In contrast to prior literature that highlights the efforts to progressively externalize auxiliary task functions, we argue that pre-automating companies deploy gig- and sub-contractual relationships to perform the infrastructural work of scaling and capturing monopolistic platform networks, as a staging ground for eventually "insourcing" core functions in future automated form. This, in turn, suggests an expanded view of contingency and risk in platform gig work beyond the short-term precarities that arise from volatility of customer demand. Aspiring platform monopolies also foist onto largely unsuspecting gig workers the risk of scaling and developing the service network, including capital investment costs for equipment (cars, delivery vans, etc.) which they expect to soon render obsolete with their automated service. Pre-automated outsourcing therefore not only produces precarious work with unstable pay: it also produces precarious micro-entrepreneurial roles whose viability may be fleeting. This may require a shift in strategy for those arguing on behalf of platform workers' labor rights.

Second, we suggest renewed attention to processes of in-house automation. Such attention demonstrates how platform companies scale toward monopolization through strategic investments and acquisitions that bring the tools for eventual infrastructural development and market capture in-house. The externalization of the automatable labor force combined with the invisibility of internal research and development efforts produce a sensibility toward impending automation as if it appears externally from nowhere, instead of seeing such technologies as gradually produced, the purposive result of years of labor and capital investment by the very same companies that eventually hope to adopt them. Such a view can also shift the conversation about "control" from a managerial to an engineering concern as the technical professions attempt to identify scriptable solutions to problems of service delivery (i.e. Stark, 1980). Future scholarship might also address the "strategic ambiguity" (Padgett & Ansell, 1993) that pre-automating companies must maintain as they simultaneously straddle such disparate sectors as

engineering and logistics, on the one hand, and driving or delivery service on the other.[20]

Finally, pre-automation might usefully shift our conversation from "the future of work" to "the futures of work." We have argued that pre-automation suggests a more dynamic view of gig labor than studies of the future of work that assume a transition to a new, steady-state phase (Briken et al., 2017; Wilkinson & Barry, 2020). This dynamism is not limited to a single arc. For instance, Cutolo and Kenney's (2019) observation that the risk to entrepreneurs grows as platforms themselves grow and mature suggests that pre-automated systems are in a race against the clock to achieve a monopoly in a market and to insource service delivery before their outsourced human workers leave. Platform workers, too, can create and participate in forums for information sharing and develop an identity around their job, and develop an occupational community (Irani & Silberman, 2013; Rosenblat, 2018; Schwartz, 2018). Futures shift, too, with shifts in underlying economic conditions. Even if imagined futures seldom come to fruition as imagined, taking corporate strategy, promissory narratives and anticipatory discourse seriously suggests how a potential strategy oriented toward automation can exert significant structuring effects within the platform economy today.

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20. This adds to the "institutional chameleon" character that Vallas and Schor (2020) articulate as pre-automating companies must maintain multiple identities for different audiences.

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The Möbius Organizational Form: Make, Buy, Cooperate, or Co-opt?

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Abstract

This paper examines the emerging contours of a new organizational form, in which firms move beyond the cooperative pacts of alliances to a radicalized, aggressive co-optation of external assets. Taking our point of departure from the literature on the "networked" firm, we point to an alternative to the make, buy, or cooperate decision: in the Möbius form, firms co-opt resources, unsecured by any alliances, formal or informal. Some companies are brazen in their co-optation, leveraging external assets so thoroughly that they might well be considered a core part of the firm. Enabled by developments in computing technologies, such co-optation challenges traditional models of organizational identity. These fluid boundaries recall the Möbius topological model, which we take as the metaphor for this nascent organizational form. We chart this new behavior by discussing a range of firm activities, including the functions of marketing, research and development, and managerial decision-making, as they are replaced with assets co-opted from other firms in the private sector, government agencies, and lastly the firm's own users.

Keywords: organizational form; co-optation; firm boundaries; organizational innovation; economic sociology; crowd work; digital labor; platform; cultural and digital economy.

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Introduction

The explosive volatility of technological progress has given rise to new organizational forms. As the post-industrial economy has shifted from trading in physical goods to information, firms have swapped heavy industrial assets and local human capital for third-party-enabled cloud computing and dispersed labor. It follows that the organizational form of the firm itself would reflexively embody this distributed arrangement, and many firms have experimented with networked organization. Some firms have even gone beyond cooperation, co-opting outside resources to replace what were once core internal capacities.

The form we analyze pushes past earlier iterations of the Möbius arrangement.[1] We observe a radicalization so far-reaching that it lies beyond the continuum of firm strategies between hierarchies and markets (Podolny & Page, 1998; Powell, 2003; Williamson, 1991). Not just another networked organization, Möbius firms defy the language of cooperation that usually defines networked partnerships. To the classic "make, buy, or cooperate" decision (Kogut, Shan, & Walker, 1992) we add a new breed of firm behavior: co-optation. Möbius firms don't make, buy, or ally. They co-opt. As we will see, this is also not outsourcing. Instead of pushing capacities out, they pull them in. Searching for assets upon which to erect their operations, firms locate and integrate value from other firms, publicly funded resources, and their own user communities. We refer to this arrangement as the Möbius firm.

From the Networked Firm to the Möbius Form

Firm activities about and across boundaries have long been a point of interest in the research on organizations. Powell (2003) and Sabel (1991) for example described arrangements in which different companies actively cooperated. In such arrangements, firms agreed to share the burden of risk as well as any fruitful innovations along the production chain. These agreements forged the shape of networks, with the network itself emerging as the result of generative rules of cooperation and coordination (Kogut, 2000). Networked relationships have also been seen as an outcome of assessing potential partners for their value and status (Podolny, 2001).

One key contribution of networked-firm analysis is the argument that such formal cooperation across boundaries anchors the identity of firms, and that their position in the network emerges from collective, dynamic evaluations of partners. Organizational boundaries are often used by scholars as anchor-points, giving shape not only to firms being described but also lending a foundation to different schools of theory. Weber's rational-legal systems assume a segregation of rational activity away from the less-rational exterior social context. Scott and Davis relied on the boundary as a critical criteria for the existence of a bounded collectivity of social actors: "all collectivities — including informal groups, communities, organizations, and entire societies — possess, by definition, boundaries that distinguish them from other systems" (2015, p. 152). In their overview of organization theory, Scott and Davis listed an array of challenges to defining boundaries, both empirical and theoretical. Some definitions are cognitive, based on the perceptions of related actors (Laumann, Marsden, & Prensky, 1983), or their shared interests (Laumann & Knoke, 1987). Networks analysts rely on measuring relations between actors, such as frequency of interaction (Homans, 1950), relational contracts (Gibbons, 2001), embeddedness in historical or relational contexts (Granovetter, 1985), and structural position in a network of firms (Kogut, Shan & Walker, 1992), have also all been posited as determinants of organizational boundaries. Still other work has examined the influence on boundaries of political bargaining (Stark, 1991; 2001) and social capital (Walker, Kogut, & Shan, 2000).

Still other theories are behavioral: Pfeffer and Salancik (1978, p. 30) proposed that individuals' activities (rather than their membership) constitute the contours of an organization, and Barnard (1938) proposed that organizational boundaries lie along the line of cooperative activities. The Möbius strategy presents a challenge across these definitions, as its action patterns bleed across these rational, cognitive, and behavioral definitions, while defying transaction-based theory of the firm (Coase, 1937).

In this paper we describe a set of cases in which firms defy all of these mechanisms and definitions, requiring new theory. The new organizational form that we study poses interesting challenges to orga-

1. Charles Sabel wrote about companies fostering partnerships to brave together the steep start-up costs and turbulent technological changes of the 1980s manufacturing sector (Sabel, 1991).

nizational theory because it raises fundamental questions about what an organization is. In taking on distributed, interwoven arrangements, these firms strain the methods and vocabularies available to organizational scholars. Traditional ways of talking about organizations, institutions, and networks have become less useful as their taxonomic definitions have blurred. New modes of organizing people, devices, and information demand robust new analytical tools, and students of organization remain uniquely equipped to build them.

Our interest is in a similar process happening at the macro level, when organizations co-opt the assets of entire neighboring firms without relational contracts, bending not just organizational boundaries but, how, as scholars, *we* use boundaries as a meaning-making device, to "identify" which firm is which. Co-opted assets bring with them the logics of their construction, being products of their native organizational action-patterns (Schreyögg & Sydow, 2010). It becomes problematic to perceive organizations as discrete units of decision-making (March & Simon, 1958; Ahrne et al., 2016), in the context of the co-optation of such neighboring asset-based logics.

Our research also introduces flexible terminology demanded by the emerging "platform economy." Firms in this space are characterized by activities breaking the traditional theoretical dichotomy between market-based and social coordination (Gillespie, 2010; Grabher, 2017). How does such blurring impact how we as scholars theorize structures? How do we delineate and conceptualize the boundaries of those firms whose operations are built on top of, and threaded through, the platform economy, contingent as they are on third-party assets? Traditional, simple ideas of boundaries between networked firms, whether inert or fluid, do not capture the action patterns we see happening in Möbius firms.

Our presentation will analyze three distinct landscapes in which we find the emergence of the Möbius form. 1) We begin by tracing how Möbius organizations co-opt *assets of other firms*, without contract, cooperation, or generative rules of coordination. 2) Second, we map the capitalization, by private industry, of *assets produced by state actors*. 3) Third, we examine a pattern of increasing prevalence, in which firms integrate into their core operations the managerial *decision-making of their own users*.

For each of these strategic landscapes, we will examine two cases (for a total of six exemplars). For the first strategy, our primary case involves the coupling of a comparison shopping app with mobile-phone cameras that facilitated the penetration of an internet shopping company (Amazon) into a retail giant's storefronts (Best Buy). For the second landscape, our primary case is The Weather Channel, chosen to illustrate the application of a uniform API to federal weather databases that fed the growth of an entire industry. The primary case in our third strategy examines the creation of a news-sharing platform (Reddit) that gives a handful of users the tools to choke off the cash flow of a large corporate entity. These developments, recasting more and more actors and objects as nodes in networked communications, have brought about the need for new theoretical language with which to describe an emergent strategy.

We build our theory of the Möbius organization using multiple contemporary case studies (Eisenhardt & Graebner, 2007) drawn from accounts in diverse contexts for several reasons. Conducting an embedded study within a single organization would be a mismatch to the boundary-challenging nature of the activities we catalogue. Moreover, an intra-organizational study would strip us of the opportunity to survey how the Möbius strategy is emergent across several different sectors, co-opting assets both public and private. Lastly, because the Möbius form challenges existing language on organizations, crossing strategies across several types of firm activity, available theory is ill-equipped to usefully inform the design of an embedded study. Our goal in this phenomenon-driven work is to extend existing theory, by sampling accounts of multiple empirical cases drawn from diverse settings. Our goals are broad in scope, addressing not an isolated case, to capture the breadth and reach of a new operational model.

We call this emerging arrangement the Möbius firm, after a theoretical object called the Möbius Strip. The Möbius Strip was designed to demonstrate mathematical ideas about curvature, rotation, and surface area. Resembling a band of paper curving on itself, any point on the band is "non-orientable," meaning it resists being defined as resting on either the inside or outside of the loop. Handily, this serves well as a metaphor for organizations co-opting assets until they cannot be described as either internal or external to the firm.

First in our catalogue of this new paradigm is how Möbius firms co-opt the assets of *other* organizations.

I. The Organization and Other Firms

New communications technologies allow companies to permeate each others' boundaries in novel ways, realigning chains of production and distribution from which firms have traditionally drawn value. One company that used digital communications to leverage another's assets, without partnerships, contracts, or even the initial awareness of the co-opted party, was Amazon.

Amazon, founded in 1995, is an e-commerce retail company specializing in consumer products. Founder Jeff Bezos, originally a Wall Street trader, started the company with a list of 20 potential products on which to build the Amazon brand. On his list were CDs, computer hardware, and books, which he described as "non-threatening" products with a low price-point. The very first book sold on Amazon in 1995 was, in a bit of beautiful historic synergy, Douglas Hofstader's *Fluid Concepts And Creative Analogies: Computer Models Of The Fundamental Mechanisms Of Thought*. As Amazon grew the company expanded into other goods, including the growing market for digital consumer electronics.

The Goliath in consumer electronics at that time was Best Buy. A brick-and-mortar retail company commanding a material theater of consumption, Best Buy occupied a substantial physical footprint with thousands of stores and hundreds of thousands of employees worldwide. They catered to the mounting global demand for mobile phones, digital music players, tablet computers, and other handheld devices. Unlike books or CDs, these products were considered to be "experiential" goods (Brakus, Schmitt, & Zhang, 2014) featuring sensory and affective attributes; shoppers liked to see and touch before buying so they visited physical shops to try them out and bought them in-store. In 2008, Amazon introduced a mobile phone application linked to the phone's camera. Users were encouraged to take pictures of products inside brick-and-mortar stores, which the app would search for in Amazon's stock. Amazon's offerings were typically at a lower price-point, because Amazon did not have to sustain the overhead of a physical presence. This insertion of their own digital purchasing pathway into brick-and-mortar stores decoupled the actions of "trying out" consumer electronics and making a purchase. Shoppers could check out these new digital products in Best Buy and then buy them from Amazon, all while standing inside Best Buy. This signaled a deliberate effort on Amazon's part to capitalize on brick-and-mortar shops as "showrooms" (Teixeira & Watkins, 2014). No longer did shoppers have to wait until they got home to their computers to compare prices, and no longer did they have to take a risk on buying a completely unseen product online. The app facilitated the rise of showrooming, in which Amazon deliberately leveraged Best Buy stores to educate consumers in both handheld digital products and online purchasing.

Best Buy did not benefit from Amazon's app. In 2011 its managers announced plans to cut back on the company's real estate holdings and posted a fourth-quarter loss of $1.7 billion in 2012. Amazon stood to suffer little from the ill health of the asset from which they drew value, as by this time the public has been thoroughly educated in online shopping. Best Buy abetted the shopping public's embrace of e-commerce, assisting Amazon's growth to become the largest retailer on the planet with a August 2017 market cap of $474 billion. We see here a firm that did not attempt to forge a partnership with another, but rather, co-opted their institutional logic and associated objects, actors, and sites.

Piggybacking onto others firms' investments as a way to achieve rapid scaling is becoming more common. WhatsApp, founded in 2009, is a digital messaging app built on top of the pre-existing contact lists in users' mobile phones. After a user downloads the WhatsApp app from a platform like Google Play or the Apple Store, WhatsApp automatically imports the users' contacts from their phone's native contact-management program. The user doesn't have to input any information into WhatsApp directly. Because WhatsApp uses these phone numbers instead of proprietary user names or profiles (like Facebook and Twitter), users' social contacts are instantly accessible through WhatsApp. This eliminates switching costs normally associated with new networked applications, because a user would ordinarily have to "re-connect" to existing friends and colleagues over and over again for every new messaging platform they joined. WhatsApp bypasses this step, achieving rapid scale by piggybacking onto the infrastructure of contact-collection furnished by the phone manufacturer. This strategy is similar to that of DropBox, another company leveraging existing social networks to achieve rapid scale.[2] Further, WhatsApp *extracts*, or *withdraws*, no value

2. DropBox, a cloud-based data storage company, is another private enterprise built atop of existing social networks. When DropBox was launched, they used referral incentives of free extra storage and a "freemium" pricing model (the most basic version of the product was free, with fees only for higher tiers of service and features), to encourage users to share it with

from the leveraged resource, but rather simply copies the value of existing contact-management structures into their own digital ecosystem. The relationship between the two is relatively sustainable — unlike Amazon's extraction of purchasing behavior from Best Buy sites.

Amazon and WhatsApp have woven their firms around assets of other companies, to substitute for what were once internal practices. Going beyond the simple use of digital infrastructures and accessing their content, these and other companies co-opt other firms' investments and products, sidestepping exorbitant costs of marketing development, network building, and app development without cooperative arrangements.

The challenges to traditional organizational literature presented by Möbius organizations will only become more pressing with the advent of platform services. While still a nascent topic, efforts have been made to build a literature of platforms: how are these systems defined? On what kinds of relationships and networks are they contingent? How are they governed? How do their participants and partners organize? What is the impact of related organizational arrangements, such as open-source and crowd-based communities? (Eisenmann, 2007; Gawer, 2009). "Platforms", while recognized as a slippery term in use across multiple territories, can be roughly thought of as "a computational infrastructure, [or] at least a technical base upon which other programs will run" (Gillespie, 2010). A central challenge to organization studies, still in need of analysis, is how these third-party platform services interact with the institutional logics of the firms built atop them. Take, for example, app developers building products for the Apple Store (a platform that operates like a private market, governed by Apple, for the sale of third-party software to users of Apple hardware). These third-party developers are not employees of Apple, yet they must interpret and apply Apple's policies, such as that of privacy, within their own companies, in order to keep selling their products on the Apple platform. Their internal organizational beliefs and values are, then, threaded with those of Apple, via platform governance (Greene & Shilton, 2017).

The rise of cloud computing and automation services built with proprietary algorithms, inside firms such as Google and IBM Watson, pose challenges to organizational sociology's definitions of core capacities, and how scholars define organizational identity. In another type of platform-based activity, the spread of private platforms functioning as public markets, such as Apple's App Store, also complicate the sociology of markets and valuation. Similarly, another novel Möbius strategy troubling traditional relations between public and private domains is the co-optation of state assets by private industry, explored in the next section.

II. The Organization and the State

A fraught narrative defines the interplay between private enterprise and public organizations. Stakeholders include taxpayers, lobbyists, corporations, the legislature, non-government entities — almost innumerable players. What the State provides in terms of infrastructure, subsidies, beneficial regulations, and general support, and what it asks in terms of tax revenue and other forms of federal cooperation, is a subject of continuous debate. The political inclinations of elected officials, and the cultural imaginary surrounding the role of governmental agencies in the free market, contribute to a fractious landscape. Exacerbating these discussions is the demanding nature of today's information economy. The unremitting need for innovation, and its steep requisite investments in research and development, contributes to an organizational ecology rife with risk. This is such a risky endeavor that the state is often the only entity equipped with the needed resources. State expenditures are critical to advancing many industries. Federal spending on research during WWII and the Cold War, for example, still bears fruit, contributing to what we know today as Silicon Valley (O'Mara, 2005). Firms engaging in such co-optation of state assets are ripe for inclusion in our second type of Möbius organizations.

The Weather Channel, our first example of this type, is broadcast to nearly 100 million homes across the United States and their app has been downloaded to tens of millions of smartphones. NBCUniversal, Bain Capital, and The Blackstone Group together paid $3.5 billion in 2008 to acquire the Weather Channel

their friends and colleagues. DropBox didn't have to build their own audiences or craft marketing campaigns — they baked the existing social networks of users into their business practices, piggybacking onto them. In early 2013, just five years after launching, Dropbox was valued at over four billion dollars (Teixeira and Watkins, 2014).

from Landmark Communications. In light of such broadcast numbers and such a massive price tag, readers might be surprised to learn that the Weather Channel pays no fees at all for the weather data on which they run their services. They leverage government assets, paid for entirely by the American public. The weather data is gathered and distributed with satellites and databases belonging to the National Oceanic and Atmospheric Administration (NOAA), data that comes coupled with a suite of software tools for developers to integrate federal weather information into commercial applications. Commercial entities, when adding value in the form of services (such as making the data easily consumable for lay audiences in specific locations or for specific purposes), sell time and space to advertisers, making revenue off of public assets (Rogawski, Verhulst, & Young, 2016). The NOAA, in recent years converting their data to the easily accessible XML format and providing existing data free of charge to most commercial entities, has fueled the growth of an entire weather derivatives industry, in an inverse of its four-lettered counterpart NASA piggybacking onto the gravitational pull of other planets.

While the NOAA provides this data to most commercial entities for free, they recognize the importance of reinvesting in the future of innovative experimentation. To that end, NOAA embarked on a new kind of mutually beneficial public-private arrangement with a handful of select partners. Google, Amazon, IBM, and Microsoft entered with NOAA into the Cooperative Research & Development Agreement (CRDA). These few members of the CRDA pay marginal fees (not for existing data, but only incremental costs for gathering new data), and provide support in the form of infrastructure and computer processing muscle. Maria Patterson, Scientific Lead of the Open Science Data Cloud, described the groundbreaking nature of this organizational arrangement: "The entire project itself is its own research experiment — asking how can NOAA work with partners in a mutually beneficial arrangement to release data into an ecosystem."

Questions of loss in the NOAA case are blurry. While one could argue that the creation of a weather derivatives industry is an investment into the larger economy, with returns to be reaped over future taxation, looking at contemporary histories of tax legislation in the United States shows a different story: the statutory corporate tax rate has been reduced, from over 50 percent in the 1950s to 35 percent in 2013 (Hungerford, 2013). This illuminates a large-scale shift of wealth, from public to private coffers, only compounded federal agencies making data available to piggybacking by private firms.

Examples abound of private firms capitalizing on public expenditures. The pharmaceutical industry pushes the boundaries of how far private entities can go in co-opting assets to substitute for internal expenditures, especially since the 1980 Bayh-Dole Act. The Bayh-Dole Act allows publically funded research to be patented, so firms can privatize public expenditures (Mazzucato, 2015). Supported by this legislation, private firms can leverage public funds in lieu of spending on internal research and development. Sinking fewer dollars in R&D means firms distribute value back to their shareholders, and raise their share value via stock repurchasing. Pfizer in 2011 allocated the equivalent of 90% of its net income to stock buybacks (Lazonick, 2014). Meanwhile, federal research provided fully 88% of the most important pharmaceutical innovations between the early 1970s and mid 2000s (Block and Keller, 2011), meaning the public is more dependent on federal support of R&D than ever before, even while large pharmaceuticals continue to reap extraordinary profits.

Businesses have long leveraged public investment for private gain. One may ask how Möbius operations differ, for example, from how commerce utilizes state-funded infrastructure like roads, freeways, and bridge. The origins of key pieces of infrastructure, for one, show that questions of "who is building on whom?" have never been cut and dry, The interstate highway system, for example, while critical to modern industry, was originally funded through Eisenhower's rhetoric of defense.

But what does this strategy mean for the future of knowledge economies on the macro scale? We've seen how Amazon helped shoppers search for products in Amazon's inventory, drawing on Best Buy as a showrooming venue. Amazon did not have to build physical retail spaces. They benefitted from Best Buy's spending. By the time Amazon's tactics forced Best Buy to downsize, the public had been educated in handheld digital goods and e-commerce consumption habits. Amazon, then, has suffered no apparent ill effects from their operation. But the resource from which Amazon drew value fell into poor health. A similar asymmetry in the pharmaceutical industry endangers future innovation funding. As long as value is extracted from the State and privatized to shareholders, the State's ability to fund future innovation and bear the burden of risk is weakened. This is especially pertinent in today's high-risk knowledge economy, where so much research needs to be done before ideas can become profitable. Unlike the relationship

between Amazon and Best Buy, the role of the State will continue to be critical to the development of innovative technologies, and the viability of the United States as a global economic superpower.

We'll next explore some of the most radical Möbius firms, leveraging the resources and labor of their own users. In this segment we trace the co-option of an asset once at the very heart of the firm: executive labor.

III. The Organization and Its Users

Commodity logic has shaped the design and function of online communication platforms (Fuchs 2014; 2015), changing the distribution and character of labor in the information economy in ways that allow firms to leverage external, unpaid assets. First, the nature of work in the knowledge economy (i.e., hyper-connected work involving computer-based communication, rather than physical labor) is immaterial (Lazzarato, 1996) and abstract (Marx, 1867). Second, mechanisms of economic surveillance shift more daily-life actions into the realm of value-producing labor, troubling boundaries between "work" and "non-work" (Terranova, 2000). So, too, the boundaries of firms in this sector become nebulous and dispersed. The more value they can draw from external networks or audience labor, the fewer resources they must expend internally. Internet-based platforms can ask crowds of interested users to furnish feedback on a product, or ideas for new technological applications, drawing on the value of "communities of practice" (Wenger & Snyder, 2000) for "user innovation" (von Hippel, 2005). While the conscription of digital labor is already widely theorized, key for our purposes is our observation that some Möbius organizations integrate user labor into the managerial workings of the firm itself: authority relations resting at the core of the firm (Bryce & Singh, 2001). The potential consequences and risks of such leveraging of external resources are understudied, and already rendering surprising impacts on some young organizations. While coordinating distributed production among multiple parties is already a hurdle even for networked firms, which are carefully governed and incentivized (Kraakman, 2001; Demil & Lecocq, 2006), the Möbius form eliminates these steering structures. Such elimination compounds risks in audacious ways. Walter Powell, in his recent treatment of crowdwork, one popular Möbius tactic, described its tradeoffs as "Security and formality [...] replaced by openness and precariousness" (Powell, 2016).

Still an emerging practice, crowdwork can constitute different types of activities (Schenk & Guittard, 2011). For the purposes of this research, we group these into roughly three models we see dominating most crowdwork companies and how they conscript the labor of their users on digital platforms. Two are the "user-as-tinkerer" and "user-as-producer" models. The third, most thoroughly progressive, and arguably riskiest, is the "user-as-manager". The "user-as-tinkerer" model incorporates the labor of users as one stage in a long developmental process. Popularly known as "open source" or "open innovation", this is an increasingly pervasive strategy in the technology sector, especially in software development's iterative release schedule. One stage of this process, called "beta testing" (Neff & Stark, 2003) sees the firm produce a product and then deploy the user base as a testing ground. Software packages are increasingly being released early to specially selected groups of users (after initial "alpha" tests are completed in-house). These "beta" testers are asked to hunt for bugs, errors, and areas for improvement in new software products, work that once would have been done inside the company. Testers are rewarded not with monetary compensation but with social capital (Bourdieu, 1986/2011) through their exclusive status, and personal fulfillment from contributing to the development of a product they liked. This status, and sense of belonging, is usually established within their community of software fans and aficionados. These communities, in a world seeing falling rates of participation in community institutions such as churches (Putnam, 2000) play an increasingly important social function in the lives of these beta testers.

Software engineering acts as an inspirational template for organizing assets and labor, by embracing iterative, continuous development (Neff & Stark, 2003). The advent of cheap personal computers and the penetration of affordable, fast internet access make this model accessible to more firms, as more minds are available for knowledge work than ever before. Quickened further by the prevalence of internet-enabled smartphones, human computing is one subset of the increasingly liquid global labor market, facilitating novel opportunities for new boundary work for organizations. Some of these experiments use classic organizational arrangements in digital form. Amazon's Mechanical Turk, for example, is a website where labor is purchased in the traditional sense, just on a new kind of platform and in smaller increments. Simply

purchasing labor from the market on a contract basis, i.e., Coase's notion of the conditions under which a firm can emerge (Coase, 1937) is not a new form of organization, but rather an example of a classic brokerage. There are other tactics emerging which, like beta testing, push the boundaries of what is considered "work" and a "worker".

Converting user activity into value blurs distinctions between work and non-work as unpaid users in digital spaces generate valuable information and data commodities (Fuchs, 2014). A pervasive tendency in contemporary capitalism, this is a defining Möbius tactic. Google capitalizes on information generated by its popular "free" services. GOOG 411, Google's free directory service, was launched in part to train speech-recognition algorithms, later implemented into its Android phone devices and Google services for iPhones. Anyone who used GOOG 411, speaking business names out loud to Google's listening computers, contributed valuable data to the development of future money-making products. Google further leverages user labor (Lazzarato, 1996; Terranova, 2000; Fuchs, 2014) in the sign-up requirements of their free email service. When registering for an email account, users follow several steps. In one of these steps, people "prove" they are human, not robots that a hacker might program to register fake email addresses. To verify their humanity, users take a test called reCAPTCHA, the "Completely Automated Public Turing Test to tell Computers and Humans Apart." In the test, scrambled images of two words are shown on the computer screen, and users read the words and type them into corresponding text fields. Robots fail these tests because computers cannot yet "read" text inside images. Unbeknownst to the Google users, however, the reCAPTCHA test only needs the first word. The second word isn't part of the test. It's a word Google needs transcribed for their digital book-scanning project. Users, typing out the words they see, are actually doing transcription work on behalf of Google.

A lawsuit was brought against Google for this practice. The complaint was primarily with Google's lack of transparency, in not alerting users that they are creating profits for the firm: "In sum, Plaintiff alleges that Google does not tell users that it profits from the reCAPTCHA prompt transcriptions, and that by misrepresenting or omitting that fact, Google extracts free labor from users." Grounded in definitions of work and the identity of an employee, the plaintiff's argument was that Google's reCAPTCHA practice violated state employment policy, and that people should be paid for their work.

Google's defense was multi-pronged. First, they argued that California's public policy stated only that *employees* need to be compensated for services, that the definition of an employee hinged in part on the magnitude of their labor, and that measured with this metric, the plaintiff was not an employee. Magistrate Judge Jacqueline Scott Corley agreed, writing in her decision:

> Defining labor as "labor, work, or service whether rendered or performed under contract, subcontract, partnership, station plan or other agreement if the labor to be paid for is performed personally by the person demanding payment"); § 350 (defining "employee" as "every person [...] rendering actual service in any business for an employer, whether gratuitously or for wages or pay"). Plaintiff fails to cite to any case that supports her theory that a non-employee transcribing a single word is owed compensation [...] it would need to be a broad policy to require what Plaintiff alleges — that a person who types a single word as a condition for receiving a free service is entitled to compensation for such "labor."[3]

Judge Corley also agreed with Google that reCAPTCHA labor is too minute to re-classify employment status. Google further argued the employees could also be administratively defined, and that the very lack of any kind of formalized contract further negated the plaintiff's claims to compensation. Because there is no contractual agreement between the two parties, plaintiff was not automatically entitled to share in profits garnered from that arrangement. The judge agreed again, and dismissed the suit.

Google's use of Möbius tactics, leveraging an external asset without any agreement or contract, was a pillar of support in their case. Möbius strategies became boundary work, pushing the border of how and when companies could use the labor of users, reshaping the contours of the firm. Google co-opts an asset in such a novel way that an actor (the user) in their organizational network required the intervention of a legal institution to redraw the borders of "labor" and an "employee". The court found in favor of the Möbius firm. In the age of distributed human computing, when private companies can aggregate individual digital microtasks into significant value (Fuchs, 2014) this legislation is a ripe opportunity.

3. Rojas-Lozano v. Google, Inc., 15-cv-03751 (N.D. Cal. Feb. 3, 3016).

Other companies deploy the "user as producer" (Neff & Stark, 2003) or crowdsourced model, where instead of performing labor on the content built by the company, users supply the content themselves. Many sites harvest crowdsourced content: Wikipedia, YouTube, Twitter, Facebook, SnapChat, SoundCloud, Instagram, and Pinterest, just to name a few, all work on the "user as producer" or "prosumer" (Toffler, 1981) model. The labor entailed in these blending relationships has been popularly theorized. An array of fields have produced literature on digital labor and its implications, including studies in science and technology, media and communication, sociology, and economics (Matias, 2016; Lazzarato, 1996; Licoppe, 2008; Terranova, 2000; Fuchs, 2014).

Other firms move beyond the user-as-producer model, to the user as manager. Leveraging external managerial labor via a community of users can create new opportunities; but it can also introduce novel forms of risk. As we shall see, deploying community members as managerial labor can realign power relations and foster unpredictable interactions between users and the firm. These realignments spark potential struggles between users and firms, between community and capital, striking at the heart of a theoretical tension in community-based forms of innovation so popularly celebrated by contemporary enthusiasts (Benkler, 2006; Castells, 2011). Paul Adler describes such tensions as a polarization in the field of organization studies, between

> those who see community as a primordial feature of persistent human collectivities, including businesses [...] [and] those who see power asymmetries as a fundamental feature of social structures [...] [who] critique as essentially obfuscatory any affirmation of bonds of community within industry (Adler, 2015, p. 446).

Adler's observation of clashing interests between community-based solidarity and capitalist relations of production can have a destabilizing impact on firms whose value is grounded in this kind of labor. One starkly visible case study in such destabilization, widely recorded in the popular press as a watershed moment for rethinking the management of community-driven innovation, happened on a website called Reddit in 2015.

Reddit is a crowdsourced internet platform resembling a bulletin board. Most of Reddit's users subscribe to one of two tiers of membership: "users" can upload links and post comments, whereas the second tier, "moderators", work a management role, via a managerial toolkit provided by the platform. Mods can alter the structure and rules of their group via HTML code governing design and interactivity. Mods set rules governing user behavior through comment etiquette standards and banning policies. To manage their groups, mods can delete posts, delete comments, ban users, and control whether their group was visible to the public. In their management of the platform infrastructure, content, and community, mods largely build the site themselves. Through their tools they took up managerial work, becoming managers on behalf of Reddit the company, except with no compensation. While spending comparatively little on community management, Reddit scaled up to over 150 million page views per month by 2016 (Traffic Statistics, 2017).

This radical application of Möbius tactics, however, held unforeseen risks. In 2011, some users engaged in an early protest of what they saw as a rise in promotional material on the site. Creating a community called "Hail Corporate", users derided posts that they saw as corporate advertisements disguised to resemble organic conversations. Such visible disassociation with corporate goals embodies an externalization of cynicism, or a form of "symbolic sabotage" in a reorientation of relations between the worker and the firm, re-pathologizing the organization by relocating the position of "defect" in what has been termed a move from "the 'tired employee' to the 'exploitative organization' " (Fleming & Spicer, 2003).

Symbolic sabotage soon led to their first actual sabotage. In 2014, a mod of a gaming sub became unhappy with the way a game company was beta-testing a new release. To try to influence the company's actions, the moderator "blacked out", or took totally private, the entire gaming subreddit — an often integral site for word-of-mouth marketing by gaming companies. The mod replaced the entire board with a picture of a lock and key, what's also known as "going dark". It was only after Reddit employees intervened that the board was restored (Matias, 2016).

In 2015, friction between the firm and users produced even more remarkable dissonance. That summer an employee of Reddit named Victoria Taylor, the communications manager and often only point of contact between moderators and the company, was let go, with no warning given to the moderators

with whom she interacted. Moderators of subreddits relying on Taylor privatized their boards, in the same "going dark" strategy used in 2014. In an Op-Ed for the *New York Times*, two moderators wrote:

> Reddit's management made critical changes to a very popular website without any apparent care for how those changes might affect their biggest resource: the community and the moderators that help tend the subreddits that constitute the site. [...] We donate our time and talents to Reddit, a for-profit company, because we truly like building cool things on the Internet for others to enjoy. [...] Dismissing Victoria Taylor was part of a long pattern of insisting the community and the moderators do more with less. [...] We are concerned with what a move like this means for for-profit companies that depend on the free labor of volunteers (Lynch & Swearingen, 2015).

The protest snowballed, with both mods and lower-tier users becoming vitriolic with their accusations of impropriety against Reddit, including a violent surge of hate speech directed in particular at new CEO Ellen Pao. In what has been widely termed the "moderator blackout", more mod shut down large sections of the site and kept them dark, cutting off traffic and ad revenue. This movement flipped the frequent characterization of digital labor, that such work embodies "new forms of labor but old forms of exploitation" (Bucher & Fieseler, 2016; Fuchs & Sevignani, 2013; Paolacci et al., 2010; Scholz, 2013), on its head.

In the uproar Pao resigned. Before her resignation, she posted the following comment on Reddit:

> The bigger problem is that we haven't helped our moderators with better support after many years of promising to do so. We do value moderators; they allow Reddit to function and they allow each subreddit to be unique and to appeal to different communities. This year, we have started building better tools for moderators and for admins to help keep subreddits and Reddit awesome, but our infrastructure is monolithic, and it is going to take some time. [...] We hired 5 more people for our community team in total to work with both the community and moderators. [...] As a result, we are breaking some of the ways moderators moderate. We are going to figure this out and fix it (Pao, 2015).

To get a broad picture of community participation and moderator mindset, J. Nathan Matias, a researcher at the MIT Center for Civic Media, conducted extensive interviews with moderators and built a dataset of subreddit activity during the blackout. Through a framework of social movement theories, including political opportunity and resource mobilization, his work affirmed that the uprising was an organized action in response to collective grievances. He found the most significant predictors for a moderator joining the blackout to be twofold. First was their workload. The larger the workload of the subreddit, (measured in number of comments as a proxy for the amount of "activity" in the group) the more likely the moderators were to join the blackout. This affirmed the statements made by moderators on Reddit and in the popular press: the more difficult their jobs, the more likely they were to revolt. The second predictor was the number of ties to other communities, held by both the subreddit and the moderator. The more people and boards they were tied to, the more likely they were to revolt. In their statements during and after the blackout, mods described ignored requests for more support and better technical tools: "The moderation tools on Reddit are another of the larger contention points between the mods and admins — they are frequently said by those who use them often to be a decade out of date."

Strife between these groups has only increased in the time since. In 2018, special counsel Robert Mueller filed an indictment against a group of Russians, including the Internet Research Agency, a company associated with the Kremlin, for running disinformation campaigns in an attempt to influence the 2016 American presidential election. The indictment mentioned Reddit thirty-five times as a site of such disinformation sowing. Steve Huffman, the CEO, admitted that Reddit had "found and removed" hundreds of accounts associated with Russian propaganda efforts (Marantz, 2018), and the *Washington Post* reported that Reddit executives were being questioned by a Senate Intelligence Committee (Romm, 2018).

At Reddit, unpaid users occupied crucial administrative roles. This is the key leap forward (and the key risk) in the Möbius organizational model: external actors could manage Reddit's executive assets, including human capital and the functional infrastructure of Reddit itself, through what Callon and Muniesa would call executive organizational equipment (Callon & Muniesa, 2005). Granting managerial tools to

users created new vulnerabilities, allowing users to express their values in ways that diverged from the business intentions of the designers (Adler, 2015). When the intentions of the organization and the resource they attempted to co-opt — their users — became misaligned, community-based moderators appropriated affordances (Nagy & Neff, 2015) to bring the activities of the firm to a halt. Later, user-based control of the platform was exploited by malicious actors running a disinformation campaign, arguably leading to one of the most shocking election outcomes in modern times.

Conclusion

As we've observed, the information economy has pushed the organizational form to novel frontiers, allowing firms to exploit opportunities across categories of labor, infrastructure, and assets.

We have broadly observed three distinct types of the Möbius form: the co-optation of *assets of other private firms*; the capitalization, by private industry, of *assets produced by state actors*; and the managerial *labor of their own users*.

A recent space probe mission by NASA serves as another metaphor for this process. A resource they've leveraged to their advantage is the gravitational pull of other planets. Orbital mechanics, as the underlying science is called, is also known as Gravity Assist, or the process of using the gravity of another planet on top of the rocket's own fuel-based propulsion. NASA's Voyager missions were engineered using Gravity Assist. In 2012, the Voyager missions lobbed a manmade object farther into space than ever before in the history of mankind. NASA needed a propulsion resource, located that resource in the gravitational pull of other planets, and wove their spaceflight plans around that asset. In 2016, we've observed earthbound firms similarly folding their companies around assets they don't own, don't use cooperatively, and don't buy from the market.

Resembling Gravity Assist, Möbius firms don't buy, manufacture, or cooperatively exchange with the resources upon which they're built. This experimental new era for organizations was facilitated by tools of ubiquitous computing, connecting more actors than ever before. These digital infrastructures have permitted organizations to co-opt existing assets in unforeseen ways. In our examples, they mitigate internal costs of marketing development, app development, and community management. While there are still costs involved (building and maintaining the technical layer of Reddit, for example, requires investment in personnel, server space, and computing), the enormous savings garnered by charging users with managing themselves, and the novelty of the relationship between the firm and this co-opted entity, cannot be ignored. Co-opting such assets allows these firms to piggyback onto existing communities of users and structures of access, facilitating economies of scale without "meta-corporate" arrangements (Sabel, 1991). These advantages suggest that the Möbius form may well represent a new operational paradigm.

No organization can be completely without boundaries (Schreyögg & Sydow, 2010). Möbius firms are no exception. They file taxes, maintain bank accounts, and remunerate their employees. As organizations must, they embody processes distinguishing them from their ecological surroundings. Our primary interest is not on boundaries, per se, but the actions taking place about them. With neither market contracts nor partnering alliances, the organizational "action pattern" (Schreyögg & Sydow, 2010) of the Möbius is to co-opt the organizational actions of other entities in their environment. This produces a novel type of firm-to-firm relationship, absent the formal markers that customarily define the firm. Such practices, taking place over, above, and in defiance of "boundaries" between a firm and other actors in its environment (Whitford & Zirpoli, 2014), reveal a form more radical than has been described in the networked organization literature. The primary question that intrigues us, prompting us to adopt the Möbius metaphor, is this: assets which are doubtless *external* to the firm, and remain external to it (i.e., they are not purchased and brought inside the firm, nor are they incorporated by a partnership arrangement), are nonetheless *vital* to its operations and its identity. This has created the need for new language to discern and describe firm activity.

Other contributions made here include an expanded conception of objects and actors in the era of Big Data, in a novel application of actor-network theory. Big Data, rather than a mutable object transferable between or across firms, can be re-conceptualized as a static object around which firms sculpt themselves and their strategies. Viewed in this framework, the boundary object is not Big Data but the organization itself.

Future research potentials are rich. One area of interest is the array of response patterns of organizations being co-opted. In our observations, co-opted users leveraged their collective power more substantially than co-opted firms, whereas the state chose to permit co-optation and even encouraged it. What do these responses suggest about relations between firms, their shared ecologies, and resulting patterns of power and contingency? Fresh challenges to organizational sociology are also presented by the advent of platform-based services, and the migration of institutional logics as embedded inside co-opted assets. In this vein, a new area of organizational sociology engages micro-sociological theory, particularly inhabited institutionalism, to examine how individuals within an organization enact a complex and multi-layered set of obligations, logics, and beliefs (McPherson & Sauder, 2013).

Far from being an exhaustive cataloguing of an emerging trend, in this paper we've discussed the shifting contours of these developments by loosely identifying three types of co-option leveraged by private companies. Traditional theoretical language used to talk about boundaries does not capture the action patterns we see happening here of organizations mutating to incorporate new imaginaries of the firm, challenging what we know and how we talk about digital economies, networked organizational identity, and the role of the firm in the Information Age.

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Disruption, Embedded. A Polanyian Framing of the Platform Economy

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Abstract

Digital platforms disrupt — not just incumbent industries, but also academic imaginations about the future course of capitalism. While some scholars envision the next great transformation towards the ultimate marketization, others anticipate a post-capitalism based on digitally revitalized notions of community and reciprocity. Starting from this controversy, the article advances a Polanyian perspective to push beyond the ostensibly antagonistic dynamics of more or less market. More specifically, the emergence of digital platforms is perceived from the angle of three key drivers that propelled the great transformation towards marketization: technology, science, state. While the break-through of marketization, in Polanyi's view, was prompted by the steam engine, the emergence of platforms is driven by the digital infrastructures of cloud computing, big data and algorithms; and while markets were scientifically legitimized by economics, platforms deploy network theories that, through their far-reaching application, perform social reality. Just like markets, however, platforms are nothing natural, but are objects of ongoing political contestations that forge the embedding of the platform economy into the regulatory framework of society.

Keywords: Platform economy; sharing economy; Karl Polanyi; embeddedness; performativity.

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1 Sharing Euphoria, Platform Disillusions

It all began as promise. Soon after the financial crisis of 2008 a sense of awakening seemed to capture academic imaginations. Even traditionally skeptical camps of social science could not resist to ruminate on an alternative to neoliberal capitalism: *sharing*. Rather than echoing the long-gone victim of the "tragedy of the commons" (Hardin, 1968), sharing suddenly held the promise of a (digital) revitalization of exchange based on reciprocity and community (Benkler, 2004; Belk, 2015). The mantra of the new digital sharing economy, "what's mine is yours" (Botsman & Rogers, 2010), presented the prospect of reinvigorating social connectivity through the collaborative utilization of idle resources (Frenken & Schor, 2017). Although the initial hopes have darkened since early exemplars of the new sharing economy have disappeared (like time banks or food swaps, for example) (Schor & Cansoy, 2019), the notion of sharing still inspires aspirations for a post-capitalist project (Fitzmaurice et al., 2020; Martin, 2016).

More recently, though, a line of reasoning has gained increasing momentum that starts from a diametrically opposed vantage point (Pasquale, 2017; Kirchner & Schüßler, 2020). Instead of a post-capitalist alternative rooted in the social practice of sharing, this line of reasoning anticipates a capitalism supercharged by the compulsive business logic of *platforms* (Parker, van Alstyne, & Choudary, 2016; Van Alstyne, Parker, & Choudary, 2016). Whereas the imaginations of a new sharing economy revolve around societal *values*, the conceptions of the platform economy center on commercial *value*. And in terms of (market) value, the four leading platform companies, Alphabet, Amazon, Google and Microsoft, indeed, constitute one of the more exclusive corporate clubs: their market capitalization exceeds $1trn (*The Economist*, 2020a).[1] Moreover, the valuation of the highest rated start-ups is, first and foremost, testimony of the approving assessment of their platform business model (Evans & Schmalensee, 2016, p. 8).

Although both positions appear categorically irreconcilable, they converge on two conjectures. First, both perspectives attribute profound economic and societal shifts to the affordances of the novel digital infrastructures of cloud computing, big data, and algorithms (Kenney & Zysman, 2016; Plantin & Punathambekar, 2019). The proliferation of these digital infrastructures has long expanded beyond the sphere of commerce and transformed modes of interaction and sociality in a paramount fashion (van Dijck, van Poell, & de Waal, 2018). Reducing this digital penetration to a mere advancement along the established trajectory in terms of speed and efficiency utterly misses the point (Sampere, 2016). At stake is rather a fundamental transformation of the social and economic fabric through novel modes of algorithmic power and control (Gillespie, 2018; Zuboff, 2019).

Second, both strands of reasoning problematize fundamental shifts in the interrelation between economy and society albeit, of course, with antithetical apprehensions (Dobusch, 2019). While sharing is expected of re-introducing "collaborative social forms able (...) to embed economic relations within social ones" (Pais & Provasi, 2015, p. 347), the "platform revolution" (Parker, van Alstyne, & Choudary, 2016) is expected to propel a further marketization of wider societal spheres (Murillo, Buckland, & Val, 2017; Fitzmaurice et al., 2020). The sharing-*vs*-platform controversy, then, is but the culmination of ongoing scientific endeavors to come to terms (quite literally) with emerging modes of socio-economic coordination that cannot be mapped on to the existing register of governance mechanisms in a straightforward fashion

1. Together with the fifth major platform corporation, Facebook (with a market capitalization of a mere $620bn), these companies make up almost a fifth of the value of the S&P 500 index of American shares (*The Economist*, 2020b).

(Reischauer & Mair, 2018; Altman, Nagle, & Tushman, 2019). The promulgation of notions like "platform logic" (Andersson Schwarz, 2017), "platform society" (van Dijck, van Poell, & de Waal, 2018), "platform capitalism" (Langley & Leyshon, 2017a; Srnicek, 2017) or, for the current context most aptly, "platform economy" (Kenney & Zysman, 2016; Kenney, Bearson, & Zysman, 2019) is aimed at indicating the novelty of the emerging socioeconomic coordination.

2 History Does Not Repeat Itself, or: Why Polanyi?

This article seeks to contribute to the conceptualization of the emerging platform economy by drawing inspiration from a most authoritative analysis of an earlier fundamental shift in the development of capitalism: *The Great Transformation* by Karl Polanyi (1957). The engagement with Polanyi's analysis of the breakthrough of industrial capitalism, of course, is not simply a concession to the semantic affinity between the current mantra of "disruption" and the assertive title "great transformation". History does not repeat itself (although it does rhyme, as Mark Twain famously quipped). Nor is our recourse to Karl Polanyi's *opus magnum* intended to insinuate that *The Great Transformation* provides the script through which the current transformation can be deciphered in an unambiguous fashion. Rather than forcing Polanyi's historically grounded framework onto a novel reality, we seek to advance a particular Polanyian *perspective* (Peck, 2013a; 2013b; Ebner, 2015; Jessop & Sum, 2019; Berndt, Rantisi, & Peck, 2020a).

We are acutely aware of the conceptual challenges of such an enterprise since Polanyi's writing rather represents a "pattern of thought" (Polanyi Levitt, 1990, p.1) than a fully coherent theoretical edifice.[2] We aim at meeting this challenge by triangulating our approach with diverse perceptions in the widely ramified Polanyi-exegesis literature. In general, our chief concern, following Rankin (2013), is rather to pose generative questions than to present terminal answers. Instead of submitting a finely granulated empirical account we are, more precisely, intent on proposing conceptual trajectories for further inquiry. Read as "a theorist of discontinuity" (Block & Somers, 2017, p. 380), Polanyi offers two general insights that inform our perspective on the emerging platform economy.

First, Polanyi traces back the rise of the market economy to a complex alchemy of political, societal, institutional and technological ingredients (Krippner, 2001; Deutschmann, 2019). Markets are not simply a manifestation of an intrinsic predisposition for individualistic utility maximization, as (classical) economics promulgate (see also North, 1977). Rather they are expressions of an intricate interplay between technological affordances, performative effects of science, and deliberate efforts to furnish political and societal institutions. Our Polanyian perspective, then, is framed around the role of technology, science, and the state in forging the platform economy.

Second, Polanyi insists that both fully self-regulated as well as completely disembedded markets never existed (Block, 2001; Peck, 2013a). While perfect markets might exist in the realm of fictive models, reality is made up of multiple variations of socio-economic coordination that coexist and conflict with each other (Berndt, Rantisi, & Peck, 2020a; Jessop & Sum, 2019, p. 157).

2. There is a rich body of work in the ramified exegesis literature devoted to the conceptual ambiguities and inconsistencies in Polanyi's writing that compellingly alerts to the intricacies of "employing" Polanyi in a forthright manner (see, for example, Hechter, 1981; Block, 2001 & 2003; Krippner & Alvarez, 2007; Peck 2013a & 2013b; Dale, 2016; Hodgson, 2017; Deutschmann, 2019, ch. 2).

A Polanyian perspective, in consequence, suggests to push beyond the binary categories of market and non-market in conceptualizing the emerging platform economy. Polanyi's reasoning, in fact, insinuates a particular analytical sensitivity towards variegation and hybridity since, as Cangiani (2011, p. 192) maintains, "[t]he history of capitalism cannot be reduced to a mechanical oscillation from a less to a more embedded economy". Nor can economies "lined up on a unidirectional track towards 'full' marketization", as Peck (2013a, p. 1541) adds.

We seek to advance a Polanyian perspective on the platform economy through the following analytical steps. In the next section we elaborate Polanyi's understanding of the historical contingency of the various modes of socio-economic coordination by drawing particular attention to the foundational elements of his framework: embeddedness and the double movement. In section 4, we elaborate the historically specific manifestations of technology, science and state that brought forth the great transformation towards industrial capitalism. After elaborating key features of platform-based governance in section 5, we employ the proposed Polanyian perspective to conceptualize the proliferation of the platform economy in section 6. The focus of our inquiry thus shifts from the role of the steam engine, classical and political economy and the liberal state in *The Great Transformation* to the impacts of digital infrastructures, network sciences and the neoliberal state on the formation of the platform economy. Section 7 summarizes key insights that the proposed Polanyian perspective yields and offers some general conclusions.

3 From Historical Account to Analytical Perspective: Embeddedness and Double Movement

During the more than seventy years that passed since the publication of *The Great Transformation* in April 1944, Karl Polanyi kept an enigmatic presence in various strands of the social sciences (Peck, 2013a, p. 1536). With the exception of John Dewey's euphoric response, the initial reception and influence remained rather limited (Aulenbacher, Bärnthaler, & Novy, 2019, p. 105). The renaissance started in the 1980s (Polanyi Levitt, 2019) and invoked what Dale (2010) and others referred to as the "soft" Polanyi, the theorist of social embeddedness and institutions that was mostly read through the lens of the new economic sociology and Mark Granovetter's (1985) seminal translation in particular. This embeddedness moment was followed by the neoliberal moment that called upon the "hard" Polanyi (Dale, 2010), the prophetic "critic of neoliberalism *avant la lettre*" (Peck, 2013b, p. 1545). The current confluence of the business obsession with the disruption of incumbent industries and established institutions together with the re-emergence of far-right policies and (at least rhetorical tributes to) the climate crisis seem to galvanize the latest wave of interrogations of the "hard" Polanyi (see, for example, Block & Somers, 2017; Brie & Thomasberger, 2018; Aulenbacher, Bärnthaler, & Novy, 2019; Berndt, Rantisi, & Peck, 2020a).

The Great Transformation, evidently, centers on a specific historical period: the breakthrough of self-regulated markets as both distinct and dominant mode of socio-economic coordination. Polanyi dates this transformation to the early modern period of the nineteenth century, and pins it down in England. He is, however, explicit in conceiving markets not as a novel mode of economic coordination, but insists that markets in earlier times had been rigorously controlled and regulated by norms, rules and social authority: "Though the institution of the market was fairly common since the later Stone Age, its role was no more than incidental to economic life" (Polanyi, 1957, p. 45).

In marked contrast to classical economics and utilitarian philosophy, Polanyi's conception of the market does not resonate with the smooth accounts of innovation and welfare gains driven by rationalistic behavior. Rather, the ascent of self-regulated markets, as Polanyi elaborates (in the first sections of *The Great Transformation*) is propelled by machinery (or technology, in more contemporary parlance) and science. Importantly, these drivers are not (quasi-naturally) emerging, but in fact socially constructed: "The gearing of markets into a self-regulating system of tremendous power was not the result of any inherent tendency of markets toward excrescence, but rather the effect of highly artificial stimulants" (Polanyi, 1957, p. 60).

Polanyi continues by framing the countervailing forces that are opposed to marketization and that stipulate social protection (Polanyi, 1957, p. 79) as "double movement" (in the second section of *The Great Transformation*). Polanyi's concept of the double movement has frequently been narrowed down to a quasi-automatic and self-protective reflex against unbound marketization. This position does not only glance over the rather inconsistent and contradictory nature of historical counter-movements against early industrialization (Thompson, 1963, pp. 234–235). Moreover, the prevailing mechanistic view of double movements (Block, 2003, pp. 285–290; Deutschmann, 2019, pp. 20–22) neglects that political forces opposing the market are not per se progressive, but potentially "endanger society in yet another way" (Polanyi, 1957, p. 4). Polanyi's notion of the double movement impedes the complete decoupling of the economic from the political and societal sphere, and the "perfect" market remains unattainable: it is an "utopian experiment" (Polanyi, 1957, p. 85), that alludes to an impossible, not to a desirable state. Since a fully self-regulated market is mere fiction, there "can be no analytically autonomous economy" (Block, 2001, p. 282).

In the proverbial real world, hence, economic practice is *always* (institutionally) embedded (Block, 2003). What is amenable to changes is the level of institutional embeddedness and the concrete manifestation of institutions that regulate society-economy relations (Barber, 1995; Beckert, 2003; Deutschmann, 2019, pp. 35–59). Markets, phrased differently, do not represent a generic, but a historically contingent form of socio-economic coordination (Cangiani, 2011; Peck, 2005). Markets, in fact, are "rationalistic constructs" (Polanyi, 1957, p. 258); they are "nothing natural" (Jessop, 2007, p. 45). Moreover, institutional embeddedness, contra canonical readings, is not an immutable and historically constant feature of the economy. Burawoy (2003, p. 255; 2014) in particular denounces the paucity of a "static sociology" that sequesters the socio-institutional realm to a solid "bed". Indeed, if the social "bed" is conceived in literal terms, there is a real risk, as Peck cautions, "that embeddedness becomes a conservative methodological apology for institutional inertia, social drag, and political complacency" (2013b, p. 1561).

Instead of a simplified static understanding of embeddedness, we rather seek to employ a more dialectical understanding of relational and restlessly contradictory transformations (see also Gemici, 2008; Krippner, 2001; Krippner & Alvarez, 2007). We also follow Callon's postulate that markets need to be "considered as the temporary outcome of confrontations of different programs, including scientific ones" (2007, p. 335), and turn to the key questions of our article: which specific forces have propelled the transformation towards industrial capitalism? And what is the role of these forces in the emergence of the platform economy?

4 Great Transformation I: The Breakthrough of Industrial Capitalism

A particularly puzzling facet of Polanyi's work is his propensity for mono-causal explanation and exaggerated argumentation.[3] At various instances, he places particular emphasis on a single driver of the emerging (self-regulated) market economy: "[T]he establishment of the market economy, and the nature of this institution cannot be fully grasped unless the impact of the machine (...) is realized" (Polanyi, 1957, p. 42: see also 1977, p. 6). On closer inspection, however, his writings also allude to the crucial role of science in legitimizing free markets and, of course, of the strategic and regulative agency of the state and interest groups (see also Gemici, 2008, p. 13).

4.1 Technology: The Steam Engine

For Polanyi, the industrial revolution, not the rise of capitalism, is the turning point of modern history. It is the great transformation towards the "machine age" in the long nineteenth century. Polanyi reiterates time and again that machinery is the driver of marketization, and not capital accumulation (1957, p. 12; p. 42; p. 75; p. 98): "Technology is in command, not capital", as Walker (2013, p. 1664) summarizes this key assumption. Polanyi, it seems, referred less to the affordances of novel technology, but took the "agency" of machines quite literally: "[T]he steam engine was clamouring for freedom and the machines were crying out for human hands" (Polanyi, 1957, p. 92).

Despite this rhetorical (and conceptual) exaggeration, Polanyi's line of reasoning on the role of machinery is instructive for understanding the interdependencies of the drivers of societal transformation. For Polanyi (1957), machinery cannot simply be reduced to technical affordances that boost productivity, but in fact changes societal relationships. While supply in the pre-machine age was negotiated through social networks and institutions like guilds, the machinery of industrialized production requires permanent and stable market-based supply:

> The more complicated industrial production became, the more numerous were the elements of industry the supply of which had to be safeguarded. (...) In a commercial society their supply could be organized in one way only: by being made available for purchase. Hence, they would have to be organized for sale on the market — (...) as commodities (Polanyi, 1957, p. 78).

Polanyi's elaboration reveals that, on the one hand, the complexity of the machinery engenders novel risks associated with any interruption in a highly interdependent production process. On the other hand, Polanyi elucidates that the implementation of machinery has an even more fundamental further consequence: an all-embracing process of commodification (Block, 2003; Burawoy, 2007, pp. 360–363; Deutschmann, 2019, pp. 46–54): "Machine production in a commercial society involves, in effect, no less a transformation than that of the natural and human substance of society into commodities." (Polanyi, 1957, p. 44).

More precisely, the proliferation of machinery induced the commodification of three resources that have never been treated as commodities before. While production inputs are produced for sale (the definition proper of a commodity), labor, land and money exist for other reasons:

3. In fact, Polanyi seems to mock himself regarding this habit: "Such an explanation (...) must appear as all too simple. Nothing could seem more inept than reduce a civilization (...) to a hard-and-fast number of institutions" (1957, p. 4).

> [T]he postulate that anything that is bought and sold must have been produced for sale is emphatically untrue in regard to them. (...) Labor is only another name for a human activity which goes with life itself, which in its turn is not produced for sale but for entirely different reasons, nor can that activity be detached from the rest of life, be stored or mobilized; land is only another name for nature, which is not produced by man; actual money, finally, is merely a token of purchasing power which, as a rule, is not produced at all (Polanyi, 1957, pp. 75–76).

In a Polanyian perspective, hence, economic value is not an expression of inherent attributes, but rather of a social relation (Jessop, 2007; Berndt, Werner, & Fernández, 2020b, p. 219).

4.2 Science: Classical and Political Economy

The Great Transformation is not only a historical account of the "machine age" (Polanyi, 1957, p. 96) but, as Callon argues, "one of the rare attempts to link up economics and economy, with a convincing analysis of the role of economic theories (...) in the establishment of a (...) market" (1998, p. 2). Although science, admittedly, did not receive the same attention as machinery, Polanyi indicates that the role of the "new science of political economy" (Polanyi, 1957, p. 128) was not limited to describing the new reality of the "machine age" *ex-post*. Rather than simply revealing the laws of the market, political as well as classical economy were instrumental in framing the market economy. As Polanyi maintains, the "discovery of economics was an astounding revelation which hastened greatly the transformation of society and the establishment of a market system" (1957, p. 125).

Polanyi (1957) portrays the United Kingdom of the Eighteenth century as a restless society whose institutional and intellectual fundaments lay in tatters. The onset of market dominance had gone hand in hand with a series of unprecedented consequences. Above all, the emergence of pauperism seemed incomprehensible to society, and scholars for a long time speculated on its origins, outdoing each other with crude explanations: poverty was traced back, for instance, to the habit of tea drinking, a new type of sheep or the domestication of dogs (Polanyi, 1957, p. 94). Only gradually, scholars began to establish a framework that allowed to explain the social dislocations of the time. Among these framings, the idea of labor market laws became particularly influential since they did not only provide explanations, but also practical advice:

> Science, precisely because it became effective within the circumference of human affairs, meant in Eighteenth century England invariably a practical art based on empirical knowledge. (...) It fell to science to suggest how to regulate and organize the vast realm of the new phenomena (Polanyi, 1957, p. 125).

This intervention into social reality, according to Polanyi, took place on two levels. On the micro level, Adam Smith's *Wealth of Nations* (1776/1999) has come to be seen as the intellectual foundation of rent-seeking behavior on markets. Although Smith himself advanced a rather multiplex understanding of human nature as morally and ethically conditioned (Hühn, 2019), his notion of an intrinsic "propensity truck, barter and exchange" has been canonized as the ultimate legitimization of the *homo economicus*. Polanyi (1957, pp. 116–117) emphatically rejected the idea that self-interest is inextricably woven into human nature as fundamentally flawed. Never, as Polanyi categorically states, "has a misreading of the past ever proved more prophetic of the future" (1957, p. 45). In his view, Smith's ideas did not represent, but

rather shape social reality because a new set of ideas "entered our consciousness" (Polanyi, 1957, p. 87) and inspired new institutional arrangements proposed by economists. Rather than human nature, then, specific institutional arrangements compel actors to vigorously pursue their self-interest (Krippner & Alvarez, 2007, p. 230).

On a macro-level, the emergence of economics changed the self-perception of the society. Most notably, it was the work of Thomas R. Malthus and David Ricardo that ascribed to the new socioeconomic laws the universal validity of natural laws. For the first time, socio-economic forces and dynamics were identified as "laws" that did not derive from philosophical, political or religious ideas. The social was no longer "subject to the laws of the state, but, on the contrary, subjected the state to its own laws" (Polanyi, 1957, p. 116). Ricardo's and Malthus' "discovery of society" (Polanyi, 1957, p. 108) did not only implicitly proscribe any efforts to interfere. Ricardo and Malthus also separated society into two distinct spheres (see also Gemici, 2008, p. 13). While the laws of the (labor) market were formulated and generalized, the idea of the autonomous economic sphere was born:

> For the self-regulating market was now believed to follow from the inexorable laws of Nature, and the unshackling of the market to be an ineluctable necessity. The creation of a labour market was an act of vivisection performed on the body of society by such as were steeled to their task by an assurance which only science can provide (Polanyi, 1957, p. 132).

By "accounting for the production of *homo economicus*" (Krippner & Alvarez, 2007, p. 230), *The Great Transformation* seems to anticipate contemporary notions of performativity (Çalışkan & Callon, 2009). Polanyi indeed elucidates that "economic actors have to be constructed; they have to learn how to behave in market situations" (Block, 2003, p. 300). Economic theory, or science more generally, hence afford templates for social practice and societal self-perception triggering discontinuities in socio-economic coordination (see also Muellerleile, 2013, p. 1626).

4.3 The State: Liberal Governmentality

Even though Polanyi portrays the state as subjected to the "natural laws" of the market, it is not a passive entity. To the contrary, he argues that the spread of market-based coordination would not have been possible without the state: "Free markets could never have come into being merely by allowing things to take their course. (...) Laissez-faire itself was enforced by the state" (Polanyi, 1957, p. 145). The market accordingly is the "*deus ex machina* of state intervention" (Polanyi, 1957, p. 67), and markets and state are not necessarily opposed to, but complement each other: "For Polanyians, the notion that markets could exist outside of state action is simply inconceivable" (Krippner & Alvarez, 2007, p. 220). Only the regulative framework imposed by the state, as Polanyi argues, can warrant the transformation of resources into commodities and ascertain the continuous supply of the fictitious commodities of labor, land and capital (Block, 2001).

The state, however, is neither neutral nor the rational outcome of an implicit societal contract. Rather, the state affords an arena for various interest groups in their struggle to strategically entrench their interests in the institutional frame of society. Polanyi provides a list of historical exemplars of how different groups leveraged the regulative capacities of the state to secure their power — or their profits. Success of some groups and failures of others are one of the historic contingencies that allowed the "market revolution" to gain ground (Polanyi, 1957,

p. 41). Later, however, the state, at least in some countries, was mobilized by anti-liberal forces of the double movement (Polanyi, 1957, p. 147) as both profiteers and opponents of marketisation aimed for embedding their interests in regulation.

With reference to the English government of the seventeenth century, Polanyi (1957, p. 41) also makes clear that the state was anything but a mere reactive entity, but instead developed pro-active agency:

> Their chancelleries (...) were anything but conservative in outlook; they represented the scientific spirit of the new statecraft, (...), adopting statistical methods and precise habits of reporting, flouting custom and tradition, opposing prescriptive rights, curtailing ecclesiastical prerogatives, ignoring Common Law. If innovation makes the revolutionary, they were the revolutionaries of the age.

From a Polanyian perspective, taken together, discontinuities in economy-society configurations and transformations of socio-economic coordination are not a quasi-natural process, but triggered by the interplay of technological affordances, performative effects of science and efforts to re-organize political and societal institutions. The next section first elaborates particularities of digital platforms before turning to the question: do the drivers that precipitated marketisation — technology, science, and state — also propel the proliferation of the platform economy?

5 Platforms: Infrastructures, Multi-Sided Markets or Ecosystems?

The answer to the question of the usefulness of the Polanyian trinity of technology, science and state is, of course, also determined by how digital platforms and the platform economy are conceptualized in the first place (Grabher & van Tuijl, 2020). In a similar manner as the notion of sharing, the term platform, of course, is normatively loaded (Gillespie, 2010). The ramified research into platforms, at the outset, had hardly more in common than an empirical interest in the novel affordances of digital infrastructures (Reuver, Sørensen, & Basole, 2018), but increasingly crystallized around three key notions (Grabher & van Tuijl, 2020, pp. 5–7).

From a socio-technical viewpoint, platforms afford an *infrastructure* that allows to design and deploy applications for computer hardware, operating and retrieval systems and the vast array of mobile digital devices (Helmond, 2015; Bogost & Montfort, 2009). Whereas the notion of infrastructure initially was largely confined to denote passive enablers of interactions between various types of users (for example, van Dijck, 2013), more recent accounts have foregrounded the power of these infrastructures to curate, select, and moderate the content that is exchanged in a largely elusive fashion (Gillespie, 2018). This infrastructural angle yields a particularly instructive heuristic since it foregrounds power relations and the contingent and relational nature of platforms (Plantin & Punathambekar, 2019, p. 166) as well as the indispensable, though typically invisible, role of maintenance for reliable performance (Leigh Star, 1999).

The shift towards a rather active understanding of platforms has gained further momentum with the construal of platforms as match-makers between previously fragmented and unconnected groups of users (Evans & Schmalensee, 2016). In the course of the pervasive digitalization of *multi-sided markets* (Rochet & Tirole, 2003 & 2006; Weyl, 2010; Hagiu & Wright, 2017), platforms have fundamentally transformed domains as diverse as the markets for goods (e.g., Amazon, eBay), mobility (e.g., Uber, Lyft), accommodation (e.g., Airbnb)

(Stabrowski, 2017; Crommelin, Troy, & Martin, 2018), labor (e.g. Upwork, TaskRabbit), funding (e.g. Kickstarter, Prosper) (Evans & Gawer, 2016; Langley & Leyshon, 2017b;) and, of course, the entire field of online socializing and content production (e.g. Facebook, YouTube) (van Dijck, van Poell, & de Waal, 2018; Fisher & Mehozay, 2019).

By placing the key emphasis on leveraging complementarity (Rietveld, Schilling, & Bellavitis, 2019), platforms have finally been perceived as *ecosystems* that encompass a group of interdependent actors that jointly develop a set of complementary assets (Gawer & Cusumano, 2014; Jacobides, Cennamo, & Gawer, 2018). A prime example is Apple's ecosystem in which Apple (the platform operator), software developers and individuals (platform users) jointly use and co-develop complementary software and hardware products (Teece, 2018). By leveraging complementarity, an increase in the demand for product A (e.g., smartphones) induces increased demand for product B (e.g., apps). Complementarity, then, holds the promise that a contribution to an ecosystem reaps greater value (and generates higher profits) than trading the same product outside the platform (Lan, Liu, & Dong, 2019).

In the blurred economic reality of diversified multi-platform companies, the role of platforms as infrastructure, multi-sided market and ecosystem as a matter of course interpenetrate each other (Butollo, 2019). Moreover, the three perspectives might accentuate different aspects of platforms, they nevertheless concur in challenging the corporate assertions of performing the role of a passive enabler who cannot be held responsible for the interactions of the transaction partners. Rather than neutral match-makers, platform operators in fact act as market-makers by deploying various business strategies (Kirchner & Schüßler, 2020). Instead of displaying market prices in a passive fashion, platform operators actively forge price regimes (Parker, van Alstyne, & Choudary, 2016). In order to get both sides of a platform on board at the same time, platform operators pursue cross-subsidizing strategies (Rochet & Tirole, 2003, p. 990) by charging a higher fee for one side (i.e. the "profit maker") while subsidizing participation on the other side (i.e. the "loss-leader"). Moreover, platform operators through both codified Terms-of-Use agreements as well as through black-boxed algorithmic governance (Cheney-Lippold, 2017) define and police quality standards and platform participation (van Dijck, van Poell, & de Waal, 2018; Schwarz, 2019). Through end-to-end algorithmic monitoring as well as pervasive rating systems, platforms, indeed, afford an "evaluative infrastructure" (Kornberger, Pflueger, & Mouritsen, 2017).

Synthesizing the current state of pertinent debates, we conceive platforms as programmable digital infrastructures controlled by platform operators who, as non-neutral intermediaries, curate the interactions of interdependent complementors and users (Grabher & van Tuijl, 2020, p. 6; see also van Dijck, van Poell, & de Waal, 2018; Gillespie, 2018; Plantin & Punathambekar, 2019). The proliferation of this mode of socio-economic governance engenders a platform economy whose emergence, of course, does not simply replicate previous great (and small) transformations. And yet, a Polanyian perspective is illuminating since its particular view on technology is a reminder to account for the wider societal consequences of technological breakthroughs. In Polanyi's reasoning (1957), machinery did not only boost the efficiency of production, but radically transformed society by triggering the "fictitious commodification" of labor, land and money. Applying a Polanyian framework to the platform economy, correspondingly, implies examining wider societal effects of the digital infrastructures of platforms. Likewise, scrutinizing the impact of science and the state, Polanyi's second and third drivers of societal change, is not a quest for superficial historical analogies. Instead, differences are instructive here. The specific way of how technology, science and the state shape the platform economy point to significant discontinuities in economy-society configurations, as the next

sections seeks to expound.

6 Great Transformation II? The Emergence of the Platform Economy

6.1 Technology: Digital Infrastructures

In a similar fashion as machines were at the center of Polanyi's reasoning, the affordances of digital technologies capture the attention of current research on the emerging platform economy (see, for example, Reuver, Sørensen, & Basole, 2018; Bucher & Helmond, 2018, pp. 4–10). Despite this seeming resemblance, a Polanyian perspective on the platform economy does not, of course, imply to simply substitute the steam engine with the digital infrastructure of cloud computing, big data and algorithms. Nor is such a perspective confined to an economistic accounting of the operative effects of the, then and now, novel technologies: whereas the machinery of the early industrial capitalism dramatically increased production efficiencies, the digital infrastructures of the platform economy are praised for their transaction efficiencies (see, for example, Parker, van Alstyne, & Choudary, 2016, pp. 7–9).

Polanyi's angle on the machine is particularly instructive because it widens the view from the technical apparatus to the economic prerequisites and societal ramification of a new production regime. As the machinery of the Industrial Age entailed capital-intensity and technical interdependencies at unprecedented levels, continuity of production became imperative. Constant supply could only be safeguarded through the commodification of critical inputs, and labor in particular. We recall Polanyi's (1957, p. 92) theatrical portrayal of machines that "were crying out for human hands." The ramifications of the proliferation of the new digital infrastructures are no less far-reaching, albeit they "cry out" for another essential resource: data.

Data are the vital input for the algorithms that perform the match-making function of platforms of bringing complementors and users together (see, for example, Evans & Schmalensee, 2016). Data, indeed, have turned into indispensable training material for algorithms that increasingly operate as self-learning, pattern discovery engines (Fisher & Mehozay, 2019, p. 1184).[4] Moreover, data on relational positions, preferences and activity patterns are essential to ensure a reasonable balance between supply-side users (e.g., Uber drivers) and demand-side users (e.g., Uber passengers) at any given point in time. Through "algorithmic personalization" of prices (Lury & Day, 2019), for example, platforms can fine-tune incentives to contribute to platforms and thus to enhance the overall attractivity of the platform for additional users on both, the supply- and demand-side (Rochet & Tirole, 2003, pp. 1017–1018; Hagiu & Rothman, 2016, p. 2). Emblematic platforms like Facebook or Google, for instance, are designed to convert the very fabric of all interactions into data which are captured and aggregated to be sold to marketing companies (Schwarz, 2019, p. 3).[5]

Data, then, correspond with Polanyi's (1957, p. 75) construal of "fictitious commodities": they are brought to the market, but are "not produced for sale." Utilizing Google maps or hitting the "like"-button on Facebook, as might be assumed quite safely, are not motivated by the intention to produce data, but rather to get directions and to signal approval respectively. The

4. In the recent past, data were often likened to oil, insinuating that they are the fuel of the future. Despite its fundamental flaws (Couldry & Mejias, 2018, p. 5), this metaphor is apposite at least in one respect: like oil, data have to be "refined," i.e. cleansed, tagged and customized by data brokers who, as the "refineries," turn the raw material into a valuable asset (Crain, 2018).

5. In 2017, the income from selling data to marketing companies amounted to 98% of the revenues of Facebook and 86% of the revenues of Google (Schwarz, 2019, p. 3).

production and commodification of data, in fact, involves processes through which platforms interpenetrate society ever further in order to tap into ever deeper pools of informational raw material that can be commodified as data (Zuboff, 2019).

The pervasive practice of platforms to continuously appropriate data that are produced through the "quasi-labor" (Fuchs, 2017) of simply utilizing platforms has been likened to a "second enclosure movement" (Boyle, 2003): this time enclosure is not about the fencing-off of common land and turning it into private property (Polanyi, 1957), but rather entails the appropriation of personal data by platforms (Dobusch, 2019, p. 110). The commodification logic, however, does not stop at an appropriation of what already has been produced, but instead is aimed at forging conditions that ensure an unrelenting production of further data: life itself "needs to be configured so as to generate such a resource" (Couldry & Mejias, 2018, p. 338). This reconfiguration of social life is informed by powerful models of business and social behavior; it are these models to which we turn next.

6.2 Science: Network Effects, Network Principles

The "discovery of economics," writes Polanyi, "was an astounding revelation which hastened greatly the transformation of society and the establishment of a market system" (1957, p. 125). Even if the current transformation of society and the emergence of the platform economy is "hastened" by multiple "discoveries," one scientific notion stands out: networks. The promulgation of "networks as organizations" (Powell, 1990) and, in more general terms, the rise of the "network society" (Castells, 1996) have been diagnosed long before the advent of the current brand of platforms. And yet, the emerging platform economy is deeply entwined with a deepening and broadening of the engagement with networks, in particular from two disciplinary angles.

The *business economics* of network effects is not just an academic sub-genre, but in fact informs business practice. Network effects are extolled as the single most powerful escalating platform dynamics, and growing the network, at virtually any cost, is the chief maxim of the platform economy. "Greater scale," in the parlance of the *Harvard Business Review*, "generates more value, which attracts more participants, which creates more value — another virtuous feedback loop that produces monopolies" (Van Alstyne, Parker, & Choudary, 2016, p. 6). Quite obviously, business studies of the platform economy are not concerned with unleashing competitive dynamics and ruling out state intervention as classical economics did during the great transformation. Instead, pertinent accounts celebrate the "virtuous circle" that creates "monopolies" and, of course, generates monopoly rents in a rather unapologetic fashion (see also Parker, van Alstyne, & Choudary, 2016; Rochet & Tirole, 2003). The "winner takes all"-logic of platforms (Parker, van Alstyne, & Choudary, 2016) is not regarded as a menace to competitive markets, but celebrated as the ultimate promise of the platform economy (Andersson, 2017; Just, 2018).

Network effects, of course, are not windfall profits, and platform operators do not wait passively from them to occur automatically. Rather, the *social science* of networks is being capitalized on (quite literally) as a rich resource of metaphors, concepts and rules that can be deployed in the tactics of platform operators. On a most general level, the notion of networks is widely employed to invoke a sense of connectedness and (non-commercial) sharing amongst the various users, even if those users "share" hardly more than the software application that governs their online interactions. Such tactics of "community-" and "share washing" (Crommelin, Troy, & Martin, 2018; see also Wittel, 2011) are evinced in the Terms-of-Use agreements that

frequently are farmed in the jargon of community and network guidelines (see, for example, Uber Technologies, 2019)[6].

Beyond this rather superficial (and perspicuous) metaphorical allusion, social scientific conceptions of networks are, indeed, employed as general "models for organizing the social" (Mejias, 2010). Analogous to the conceptual apparatus of business economics, principles and rules of social network analysis do not only provide the conceptual tools to describe social reality, but also produce social realities in a performative fashion through three interrelated practices (Grabher & König, 2017). First, the diffuse and multiplex social world of interactions and associations is transformed into the crisp relational trope of ties and nodes. There is, of course, "nothing innocent about making the invisible visible" (Strathern, 2000), and the network trope achieves nothing less than a "socio-metric subjectivation of actors" (Cardon, 2020): ego is a node in a meshwork of ties.

Second, the design of big data analytics and algorithms that are aimed at ensuring a continuous production of data — as a byproduct of socializing "which goes with life itself" (Polanyi, 1957, p. 76) — is increasingly informed by key principles of network analysis. LinkedIn, the social media platform for professional socializing, for example, leverages network concepts like transitivity (Granovetter, 1973) and homophily (McPherson, Smith-Lovin, & Cook, 2001) to catalyze networking activities through affiliation engines that bring "people you may know" to your attention (Grabher & König, 2017, p. 126). This manifestation of "instrumentarian power" to modify and monetize social behavior (Zuboff, 2019, p. 139) is not an overt attack on society, enforced by strict orders and bans; it rather shapes behavior gently through "nudges" and offers the benign playfulness of "gamification" (Couldry & Mejias, 2018, p. 344). By mobilizing essential behavioral formulas of games, like competition, quantification and reward (Woodcock & Johnson, 2018, p. 543), gamification relentlessly entices the "sharing" of contents, appraisal or mere attention. The tactics of gamification are based on network models of social behavior that are deployed to incentivize the production of ever more relational data to further advance those very models of social behavior on which gamification is based (Cohen, 2020, ch. 3).

Third, key principles of network thinking have long ago been translated into advice for business practice as well as for everyday-life. The ubiquity of platforms like LinkedIn and Facebook has galvanized the emergence of a distinct genre of guidelines and prescriptions of how to manage and to "optimize" networks. This genre evolves in various media, ranging from academic publications (see, for example, Burt & Ronchi, 2007), over the "airport-literature" of "how-to"-guides to dedicated seminars and, of course, the inevitable TED-talk (for example, Burkus, 2018). In contrast to earlier attempts to evangelize rules of how to link up with "friends in higher places," the recent wave of networking guidelines explicitly mobilizes the authority of (social) science (Grabher & König, 2017, p. 131). Just as the *homo economicus* was scientifically framed and legitimized, the networked ego of the platform economy has to be fabricated by enhancing overall network literacy.

6. The "learned helplessness" imposed by the deliberately impenetrable legalistic lexicon of Terms-of-Use agreements have been likened to the legitimization strategies of Spanish conquistadores who demanded acceptance of the Spanish *Requerimiento* by a non-Spanish speaking local population (Couldry & Mejias, 2018). The privacy policies of the Google smart-home platform Nest, for example, consist of 5,242 words (*The Economist*, 2019).

6.3 State: Managerial Governmentality

The cardinal assertion that "[l]aissez-faire itself was enforced by the state" clarifies the Polanyian (1957, p. 145) understanding of institutional embeddedness: market dynamics cannot be conceived outside state action (Krippner & Alvarez, 2007, p. 220). During the take-off of industrial capitalism only the regulatory framework imposed by the state could warrant the transformation of resources into commodities and ascertain the continuous supply of the fictitious commodities of labor, land and capital (Block, 2001). The state was both actor and political arena in which various interest groups struggled over entrenching their interest into the regulatory framework of society (Polanyi, 1957, p. 41). Regulation, in a Polanyian perspective, is always embattled, and not a means to end battles.

In the emerging platform economy, the principal roles of the state as actor and as arena remain unchanged; the specific types of regulation, however, are transformed in a fundamental manner and hone in on the commodification of the key resource of the platform economy: data. The key arena of regulatory struggles, in fact, is the "unilateral incursion" (Zuboff, 2019, p. 139) of platforms into society for the purpose of pervasive data extraction and commodification. To preempt any allegations of lawlessness, legal entrepreneurship has engendered an entire genre of Terms-of-Use agreements (Schwarz, 2019). These "uncontracts" (Zuboff, 2019, pp. 220–221) invoke the notion of a public domain that underwrites legal privileges to take (purportedly) raw data, to subject them to processing, and to impose the individual understanding of legibility of each individual platform. Terms-of-Use agreements, hence, "are performative acts of consummation. Together with the technical protocols that structure interactions (...) they work to leverage ad hoc and contingent trade secrecy entitlements into de facto property arrangements" (Cohen, 2019, p. 242). These acts of legal entrepreneurship, then, are not attempts to sideline the law, but rather to catalyze shifts in legal relations of accountability and to create new zones of immunity by mobilizing altered understandings of legality (Cohen, 2020, ch. 3).

The ongoing regulatory struggles over "datafication" (van Dijck, 2013) also induce a more general transformation of "governmentality" (Rose, O'Malley, & Valverde, 2006). Governmentality during industrial capitalism was liberal, in a broad meaning of the term, with the inherent contradiction that is at the core of Polanyi's (1957) prominent (if somewhat ambiguous) notion of the double movement. Although the economic rationality of free markets is regarded as the most virtuous and infallible source of social ordering (Smith, 1776/1999), it requires vigilant state stewardship to safe markets from self-destructing dynamics. Neoliberal governmentality seeks to resolve this inherent contradiction by employing market rules and practices in the framing of regulation while, at the same time, subjecting these rules and practices to managerial oversight (Gane, 2012; Kirchner & Schüßler, 2019, pp. 8–9).

The emerging "managerial governmentality" is "procedurally informal, mediated by networks of professional and technical expertise that define relevant standards, heavily reliant on privatization and automation strategies, and opaque to external observers" (Cohen, 2019, pp. 243–244). In their concrete interactions with the state (that often seems overwhelmed by the technical complexities of digital infrastructures), platform operators privilege self-regulation and self-certification over governmental oversight. "Content moderation at scale," to allude to just one manifestation of managerial governmentality, relies on a combination of algorithmic governance, self-regulation and standardized performance reporting as means of demonstrating compliance (Gillespie, 2018, ch. 2).[7] One of the key regulatory achievements

7. Self-regulation typically combines horizontal surveillance (users are encouraged to report violations of the

of platform capitalism, as Cohen concludes, "is the degree to which it has taken on the mantle not of deregulation but of managerial reregulation to prevent different institutional configurations from emerging" (2019, p. 244). To which extent managerial governmentality in the pervasive process of datafication will elicit a Polanyian-type double movement beyond sporadic initiatives of civic hacking and data activism (Beraldo & Milan, 2019) is yet to be seen.

7 Polanyi and Platform Capitalism: Useful Perspective or Yet Another Misapprehension?

While our paper ends with critical reflections on neoliberal governmentality, it took off on a rather optimistic note. Soon after the financial crisis of 2008, the rather scriptural book title "What's mine is yours" (Botsman & Rogers, 2010) had morphed into a key tenet of a mode of economic exchange that aimed at a revitalization of social connectivity through the collaborative utilization of idle resources: sharing (Belk, 2015). The prospects of a post-capitalist alternative to neoliberalism rooted in a new digital sharing economy, however, started to turn gloomy the more the business logic of platforms achieved its cardinal promise: disruption (see, for example, Parker, van Alstyne, & Choudary, 2016). Although the debates over sharing *vs* platform or, phrased differently, revitalized community *vs* network effects apparently start off from diametrically opposed positions, they foreground a fundamental discontinuity in the relations between the economic and the social.

To conceptually disentangle these debates, we turned to Karl Polanyi's (1957) as a most authoritative "theorist of discontinuity" (Block & Somers, 2017, p. 380) particularly with regard to the relations between society and economy. With our recourse to Karl Polanyi's *opus magnum* we do not suggest that *The Great Transformation* provides the script through which the current emergence of the platform economy can be deciphered in a straightforward fashion. Rather than forcing Polanyi's historically grounded framework onto a novel reality, we seek to advance a particular Polanyian *perspective* (see, for example, Peck 2013a; 2013b; Jessop & Sum, 2019; Berndt, Rantisi, & Peck, 2020a) in which "[n]o economy-society configuration is permanent or neutral" (Rankin, 2013, p. 1654).

The breakthrough of industrial capitalism was bound to specific historic, social and technological conditions — and so is the emergence of platform economy (see, for example, Gillespie, 2018; van Dijck, van Poell, & de Waal, 2018). Viewed from a Polanyian angle, the current proliferation of the platform economy, rather than a quasi-natural process, unfolds in a "complex alchemy" (Krippner, 2001) of technical affordances, performative effects of science, and deliberate efforts to regulate and govern the economy. This article argued that the drivers that precipitated industrial capitalism, technology, science, and the state, also fuel the current emergence of the platform economy albeit, of course, in a different manner.

First, as much as the market economy was propelled by the steam engine, the proliferation of platforms is driven by the digital infrastructures of cloud computing, big data analytics and algorithms (Kenney & Zysman, 2016; Fisher & Mehozay, 2019); and whereas the steam engine implied a commodification of labor, land and capital, the digital infrastructures transform the relational quasi-labor of interacting (Fuchs, 2017) into (relational) data that then are fabricated into tradeable commodities (Cheney-Lippold, 2017; Zuboff, 2019).

Terms-of-Use agreements) with vertical control through moderators who (as low-income and low-status subcontractors) perform "proletarian judicial labor" (Schwarz, 2019).

Second, while the "discovery of economics" (Polanyi, 1957, p. 125) was instrumental for the framing of markets and the legitimization of strict market non-interference (Gane, 2012), the current emergence of the platform economy is scientifically conceptualized and promulgated through network theories, in two different disciplinary manifestations. On the one hand, business economics extol network effects as the single most powerful escalating platform dynamics (Van Alstyne, Parker, & Choudary, 2016, p. 6). On the other hand, key principles of social network analysis are deployed to inform the design of algorithms to entice the continuous production of new relational data (Couldry & Mejias, 2018; Grabher & König, 2017).

Third, although the dual role of the state as actor and as arena for regulatory struggles among the various stake-holders, in principle, remains unchanged, the specific objects and types of regulation changed fundamentally. Industrial capitalism is associated with liberal governmentality (Cohen, 2020, ch. 3) that was focused on ensuring the continuous supply with the fictitious commodities of labor, capital and land. In the platform economy, in contrast, the commodification of (relational) data is the key regulatory concern (Schwarz, 2019; Zuboff, 2019). The evolving managerial governmentality seeks to meet this challenge by employing market rules and practices in the framing of regulation while, at the same time, subjecting these rules and practices to managerial oversight (Gillespie, 2018, ch. 2; Cohen, 2020, ch. 3).

Karl Polanyi, as theorist of discontinuity but also of economic heterogeneity, however, reminds us not to confine theorizing to the driving forces of the emergence of a *single* mode of coordination (Peck, 2013b, pp. 1555–1558). In this Polanyian spirit, we conclude with the suggestion to proceed with the analysis of the various institutional configurations and regulatory regimes of a platform economy "in the making", how they might be combined with, or live alongside other governance modes, in various degrees of contradiction or complementarity (Mair & Reischauer, 2017; Butollo, 2019; Grabher & van Tuijl, 2020).

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Polanyi, Callon, and Amazon: Institutionalist, ANT, and DRAN Approaches to Platform Economies

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Abstract

Drawing on a detailed analysis of Grabher and König's study of platformization (Grabher & König, 2020), this essay develops a revision of Actor-Network Theory by proposing how a Device, Representation, Actor and Network or a DRAN Approach can be more helpful in making sense of platform economic processes. First, it locates the ways in which Grabher & König's article approach platforms from an updated Polanyian perspective. Second, it elaborates on how the aforementioned article critiques static Polanyian perspectives while at the same time building a double tension by a) not being clear whether we observe "the platform economy" as an *object* or platform economization as a *process*, and b) not paying sufficient attention to how platforms that draw on intangible materialities move beyond being mere marketization relations. Third, it presents how to address these tensions by drawing on novel theoretical advances of DRAN Approaches and fresh empirical research concerning platform economies, located at the intersection between computer science and social sciences. Proposing a possibility to integrate historical and contemporary studies of economic processes, the essay ends by elaborating on how Grabher & König's article has a potential to enable a multi-perspective dynamic research strategy in making sense of not only the contemporary working of platforms, but their historical and socio-technical condition of possibility.

Keywords: Platform; Marketization; Economization; ANT; Polanyi.

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Platforms have caught societies and social scientists off-guard. Once perceived as shining new developments, platforms such as Amazon and Google are now considered as dark forces that undermine economies, polities, and communities. This is because, their critiques argue, they build mega oligopolies in economies, polarize politics, and disrupt social ties, digitally. In trying to figure out this new world, the social sciences are challenged, too. They approach platforms as infrastructures, technologies, ecosystems, markets, devices, or spaces, at a time when popular representations are dominated by much rupture talk, a style of thought that likes to locate any new development in terms of a decisive break from the past.[1] Some say platformization is a revolution, while others find nothing new under the sun. Some progressives see an opportunity in it, whereas critics perceive it as Goliath.

Grabher & König's (2020) inspiring article "Disruption, Embedded. A Polanyian Framing of the Platform Economy" has come at a time when we seem to be unsure from where platforms have emerged, how and whether they work, and what consequences they entail. Presenting a timely intervention into platform debates from the vantage point of Polanyi, they invite us to rethink Polanyi's potential contribution to our understanding of new economies. Their choice is an excellent one. At a juncture when Marxism had been silent on the nature and origins of markets, while a neo-classical global chorus had been rather loud in describing markets as natural, Polanyi had shown us that markets were designed and maintained with particular interests in mind. Still representing the most powerful and convincing macro history of the origins of modern markets, *The Great Transformation* (1957) continues to be a source of inspiration as we feel dazed and confused.

1 Old Book, New Inspirations

What is to be done with this inspiration? There exist two broad ways of addressing this question: The first, more analytical, static and orthodox path follows Polanyi to show the social nature of everything economic, and then stops there. Prices? Social. Markets? Social. Platforms? Also social... Implicitly criticizing such an anti-Polanyian spirit in claiming Polanyi's heritage, Grabher & König (2020) present us with a second, fresh and dynamic Polanyian approach. Drawing on a new conceptualization of platformization, their path also presents a *new* interpretation of and opening in Polanyian perspectives. The result is exciting.

They avoid two economic sociological temptations, or what they call "misapprehensions": First, they do not focus on showing the "social" nature of things, but they start from there to explain the emergence, working, and maintenance of economic processes *per se*. For them, embeddedness is not a final call, but a starting point. Second, "rather than forcing Polanyi's historically grounded framework onto a novel reality," they take a fresh look at Polanyi's vantage point as they analyze platformization (p. 109). They begin with (re)-interpreting the Polanyian approach through the lens of *marketization*, a term that Polanyi used not even once in *The Great Transformation*. Describing the *The Great Transformation* itself as marketization, Grabher and König explain the emergence of digital platforms in reference to technology, science, and state.[2]

1. For other examples of rupture talk and a more detailed definition, see Hecht, 2002.

2. Drawing in part on Polanyi and beginning our work with an epigraph from him, Michel Callon and I have proposed a research program on marketization and economization, arguing that markets and economies can best be studied as processes, and not as things. For a detailed discussion of this proposal see (Caliskan & Callon, 2009; 2010).

Such an elaboration has two advantages. First, it pushes back against the rupture talk around the notion of platforms, which announces a revolution in everything and (if one is to believe TED talks) every other week. On the contrary, Grabher and König's perspective locates platformization as one instance in the *longue durée* of a great economic transformation. Second, their approach calls for a new empirical attendance to the processes that make and maintain a new form of marketization — that is, marketization on platforms. As a result, they help us imagine new avenues of market reform by way of potential regulation, in rapport with questions concerning social justice.

2 Platform Works

Grabher & König's (2020) argument draws on a literature review that shows how social scientists have approached the elephant in society's room — that is, economic platforms — in the following ways: (1) as *infrastructures* from a socio-technical view point; (2) as *multi-sided markets* from an exchange angle; and (3) as *ecosystems* that make up social scaffolds enframing actors. Instead of critiquing these approaches, some of which are in contradiction to Polanyi,[3] Grabher and König synthesize them by seeing platforms "as *programmable digital infrastructures* controlled by platform operators who, as non-neutral intermediaries, curate the interactions of interdependent complementors and users" (p. 104). The multiplication of these platforms, together with the enhanced and renewed participation of technology, science, and the state has given birth to what they call "the platform economy." Like Andreessen (2007), they put the stress on the programmability of digital infrastructures: "If you can program it, then it's a platform. If you can't, then it's not" (quoted in Bogost & Monfort, 2009, p. 4). "The platform economy" they refer to is by definition "the programmable digital infrastructure economy." Their reinterpretation of Polanyi serves as a lens to make visible and analyze such a new big change, or what they call the "Great Transformation 2." (Grabher & König, 2020, p. 105)

One may ponder whether they are merely dragging Polanyi's explanation of the origin of markets into a twenty-first-century context: Polanyi explained the rise of the market economy in reference to technology, science and politics; so let's find out what's new in those domains and put together an explanation of, in this case, the platform economy...

It is at this point that Grabher & König's (2020) innovative intervention comes into clearer view. Instead of parroting Polanyi's theoretical approach, they readjust his perspective to see new developments in *new* ways. Such a distinctive exercise also calls for a new interpretation of Polanyi's oeuvre. For them, there have been three simultaneous emergences that have given birth to 'the platform economy': (1) Technology in digital infrastructures and data systems has commodified data and made data a new fictitious commodity (p. 105). They base their observation on the production of economic relations that seek more fictional things. They illustrate not only fictionality, but also the relations of fictionality production. Such a perspective opens up an area for new investigations into historically specific practices and actor-network clusters that carry out such a difficult yet successful operation. 'Fictitious' does not mean unreal for them; it means realized on the ground. (2) Scientific practice, such as network sciences and analysis, contribute to the making of economies, thanks to their performativity (p. 106). Taking

3. As an example of one such approach, Rochet & Tirole (2003) drag platforms into the purview of a neoclassical perspective that treats them as mere markets with multiple sites. Such a neoclassical rendering of platforms in late modernity has entailed the definition of platforms as a variety of self-contained markets that can be studied without the need to consider their sociological universe. For a critique of such approaches, see Caliskan, 2020b.

their inspiration from Callon and MacKenzie, and in part drawing on their own previous work, they not only theoretically discuss such a performativity at work, but they also measure, test, and empirically demonstrate the performative effects of new network sciences on platformization processes (Grabher & König, 2017). Finally, drawing on a Foucaultian understanding of power,[4] they locate "managerial governmentality" — with the state at the center of this distributed political agency — as a process that injects market logics into economies (Grabher & König, 2020, p. 110).

3 A Thing or a Process?

In addition to such novelty and original thinking, their perspective incorporates two tensions. The first is internal and theoretical (the thing or the process?), while the second is consequential and external (new empirical developments out of sight).

First, the argument oscillates between defining an *object* called "the platform economy," on the one hand, and analyzing an emergent and open *process* of economic platformization, on the other. Used 26 times within 15 pages, the term "the platform economy" assumes, very much like economists' approach, the existence of a self-contained system of economic interactions, then proceeds to claim an embeddedness in another object called "the society." However, such an objectifying hegemonic thread was later corrected by a small yet potent intervention. In their paper's conclusion, Grabher & König (2020) argue that what needs to be studied is, in reality, "*various* institutional configurations and *regimes* of *a* platform economy *in the making*" (p. 110). This antinomy between an object analysis of claimed completeness and that of an incomplete process of unfolding informs the second tension.

Second, their analysis at times accepts static notions of platformization and aims at building a dynamic theoretical conclusion on such notions, while not theoretically including threads of platformization that have thrown new light on these new economization processes, such as (1) platforms' variegating of economization processes that go beyond marketization, and (2) new data materialities.

The first development, which holds the potential to convince us to think of platforms in an empirically new way, comes from new economic worlds emerging around us, associated with economic services such as those of Amazon, Facebook and Google. A quick look at their operations clearly elucidates how they move beyond marketization relations. Amazon draws on supplying people with spaces and tools of marketization — hence, a space of production. Their material infrastructure now competes with seemingly non-platform companies such as Walmart. Producing from simple socks to advanced computer chips, Amazon is now one of the largest manufacturers on the planet. Owning a whole fleet of cargo planes and trucks, it is expected to "surpass UPS and FedEx in total package volume by 2022" (Mitchell, 2020). To say the least, this is not a "multi-sided market," nor an "ecosystem." Facebook draws on barter economization: It gives users a chance to share the picture of a puppy and therefore grabs another users' attention. It financializes this barter network to sell advertisement space. Facebook cannot be understood based on an economistic reasoning about markets; it is something more (Grabher & van Tuijl, 2020).

Examples can be multiplied to show that we are facing the emergence of a new economization process. This process operates on multiple interactive layers, with an ancillary relationship

4. Foucault's insistence and demonstration that modern sciences make the relations which they study has been among the origins of the performativity argument (Foucault, 1980; 1986).

in delivering an empirically observable range of economic functions. In an article on cryptocurrency exchange platforms published in this issue (Caliskan, 2020b), I argue that we can describe platform works as "*stack economization*", referring to mutually supporting and enabling platform-based exchange, production, barter, and representation practices that their makers and observers qualify as economic.

The second theoretical novelty concerning new empirical phenomena has to do with the nature of data realities. Data play a central role in platformization. It is essential to accurately interpret what data and algorithms are, before we can discuss what they do and how actors and algorithms use each other. The literature on platformization tends to bypass an empirical examination of the digital universes of data and algorithms, and straightaway discusses how they are used for capitalist objectives, for illiberal motivations, or for building new regimes of exploitation and governance — all of which may, in fact, be true. However, there arguably has been an inclination to essentialize algorithms and data as if they did this or that by themselves, or as if they could be used by actors as mere tools (Neyland, 2016). Drawing on and bringing together an impressive computer science and social research literature, Paul Dourish (2016) has offered an alternative: Algorithms, data, data structures, and programs are categorically separate entities with varying degrees and types of limits and openings. Thus, a relational and differential socio-technical analysis of these entities *should* accompany the ways in which their consequences are analyzed. Such an approach would equip social science research not only with more accurate descriptions of how actors do things on the ground, but also help to imagine alternatives and interventions in rapport with various justice considerations.

Perhaps more importantly, again drawing on a wide spectrum of literatures, but especially to that of Donald MacKenzie, Dourish has joined other scientists in demonstrating the *materiality* of/in digital practices, instruments, and informational entities such as data. These materialities not only refer to computers, their cables, or tangible things that human actors can touch, but they also encompass the material orders that representational systems build and operate (Dourish, 2017). Such a perspective opens a space for new social research that examines "the material forms in which digital data are represented and how these forms influence interpretations and lines of action" (Dourish, 2017, p. 4). The platformization of economic relations entails historically specific rematerializations that need to be studied, and not factored out or essentialized as non-material things, data, algorithms, or simply as "digital."[5]

4 Towards DRAN Approaches?

Regardless of methodological, epistemological, and disciplinary concerns, the social sciences pursue three objectives when they approach phenomenon X: (1) analyze the emergence and social conditions of the possibility of X, (2) describe the consequences of X, and (3) explain how X works. Condition of possibility and social consequence approaches share an important commonality: In order to sustain their macro sociological and historical perspective, they tend to assume that they know how X works and then move on to discuss its emergence and consequences. This is why the brilliance of *The Great Transformation* rests on irony. It does not (and does not have to) explain empirically how even a simple market works on the ground. It

5. To give an example, an analysis of intangible and tangible materialities used in cryptocurrency exchange platforms is necessary to make sense of how these platforms are made and maintained on the ground. For an empirical demonstration of this point, see (Caliskan, 2020a).

describes markets' historical emergence and the social universe in which they are embedded. The *X* remains an *X*, embedded now in *Y*.

Actor-Network Theories (ANT), a term first proposed by Callon (1986) and developed in association with Law (1992) and Latour (1996), have aimed at filling that gap. *The Laws of the Markets* was the parting shot, showing the historical relevance of Polanyi and moving beyond it so as to explore the empirical specificity of economization processes, the *X* itself (Callon, 1998). A whole new generation of scholars followed this path, inspired by it, broadening, and developing it; and in time, they brought together an explanation program that added two more considerations, D (Devices) and R (Representations), to A (Actors) and N (Networks).

ANT's contribution to the universe of actors has been to open up social theory to a multiplicity of agencies. As I write this essay during the COVID-19 pandemic, it is a telling irony that we can no longer discuss economies without considering non-humans such as viruses. Be they collective or individual, human or non-human, such a proliferation of actor types has contributed to the emergence of a more nuanced study of economies.

Networks and their study had been around before ANT ever emerged. Yet, their explanatory power was either exaggerated by strands of research such as structuralism or downplayed by a variety of methodological individualist accounts such as micro-economics. ANT's contribution was to build a theoretical caution against *a priori* takes on either actors or networks. Explaining action in reference to distributed agency, ANT's intervention helped researchers imagine a more nuanced approach to X. Now it is rather commonplace to build an argument that draws on the interaction of infrastructures and agents in explaining economic action, without assuming that first come networks and then actors do things in and with them, or vice versa (Blok et al., 2020).

A and N, however, are not enough to build a rules of thumb list of main dynamics in explaining *X*. With the increasing digitalization of exchange relations, a burgeoning literature has shown the effect of representations (R) on social action in terms of their performativity. Returning to Foucault's historical exposition of how modern sciences contributed to the making of modern subjectivities and power, scholars loosely or tightly associated with ANT have presented empirically robust and analytically strong demonstrations of how certain representations not only represent, but also contribute to the making of realities on the ground via their performativity. (Finch et al., 2015; Glass & Rose-Redwood, 2014; Grabher & König, 2017; Lépinay, 2007; MacKenzie, 2004; Olofsson & Zinn, 2019).

Finally, devices (D) have been shown to contribute to how actors, networks and representations interact to give birth to processes of actions. From the supermarket cart to the computer, from the mouse to the gun, it is now empirically demonstrated that the presence and absence of devices configure the spectrum of action for agents (Barrey et al., 2000; Callon et al., 2007; Hawkins, 2012; Mason et al., 2015; McFall, 2009; Roscoe, 2015). When guns are not regulated and can be found all too easily, as in the sad case of the US, we see a high homicide rate. Guns and actors kill, together.[6]

How can approaches that draw on an analysis of Devices, Representations, Actors, and Networks — in short, DRAN — contribute to an analysis of platforms? What advantage would such an approach offer? What would be its limits? Its main advantage lies in it not being a 'theory' and instead working as a strategy of research or approach. Rather than contributing

6. One may argue that a device is a mere actor. It is not. Devices are the necessary bridges between actors and networks. Without them, we cannot understand socio-technical universes of distributed action. For a discussion of devices such as guns and how they are not mere actors see (Latour, 1999).

to the objectification of its foci of study, DRAN approaches can be deployed without locating a definitive 'the' in social, economic, cultural, technological, and political *processes*.

Second, it provides researchers with the possibility to avoid prioritizing networks (a platform is an infrastructure, structure, architecture, system), actors (users, platform owners, engineers), devices (computers, cables, programs), and representations (formulas, data) when analyzing platforms. Furthermore, it puts the emphasis on socio-technical processes, and not the places of their operation when explaining economic practices. This helps us to avoid confusing the place of action with the action itself — for instance, by arguing that a platform is a place where buyers and sellers meet.

What are the limits of DRAN? The first is the embedded tendency to pay insufficient analytical attention to the relations of power that take place in instituted processes populated by states, corporations, and international organizations. Second, and perhaps resulting from the first, it has less power for delineating historical conditions of possibility and, thus, the social consequences of the processes it studies. Deliberately focusing on describing micro- or meso-scale processes, DRAN approaches are potent as long as the boundaries of their explanation remain limited. Yet, they risk running out of steam when it comes to discussing the historical and/or macro-sociological context of their explanandum.

The potential I see in Grabher & König's (2020) article consists of a framework that enables a simultaneous operation of three research motivations examining the condition of possibility, consequences, and working of *X*. Their vivid exercise of connecting the *explanandum* with the *explanans*, weaving an argument between historical explanation and contemporary analysis, without giving up the consideration of social consequences, produces a bright theoretical light made up of three beams.

The first beam of theoretical light renders visible the fact that historical institutionalist and DRAN approaches can be simultaneously deployed in studying even the most contemporary economic phenomena, such as platforms. This exercise has demonstrated that, theoretically speaking, a dynamic Polanyian perspective with a DRAN approach to the role of performativities can indeed work coherently. Second, such an integrated theoretical design makes it possible to imagine a space for critique and historical explanation in contemporary analyses that tend to revolve around various rupture talks. And finally, and perhaps most importantly, at a juncture when we are running out of time in terms of global warming, Grabher and König's perspective provides us with analytical tools and a theoretical framework to weave critique, historical expose, and thick description together without prioritizing one over the other. They provide us with an innovative framework within which we can conceive new organizational interventions, political demands, and socio-technical devices to pursue novel ways of seeking justice, as well as ways of elucidating new geographies of injustice.

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From Performativity to Performances: Reconsidering Platforms' Production of the Future of Work, Organizing, and Society*

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Abstract

This essay takes as its starting point Gernot Grabher and Jonas König's (2020) piece, "Disruption, Embedded. A Polanyian Framing of the Platform Economy," and suggests focusing on how digital platforms are realized on the ground. We propose that the people experiencing platformization have a strong influence over the futures that platforms can evoke. To illuminate this interplay between people and platforms, we offer a taxonomy of three ways that people intervene in how platforms produce the future: innovation, articulation, and opposition. In doing so, we build on Grabher and König's essay to enrich the analytical and predictive power of their framework. Moreover, we provide the beginnings of a theoretical framework of our own — namely, a sociology of people's performances and their role in future-making — which we believe can contribute to ongoing discussions on the future of work and organizing.

Keywords: Platform; performance; performativity; technology; work; determinism.

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1 Introduction

Determinism haunts today's rhetorics on the future of work, organizing, and society (Collins, 2018; Lebovitz et al., 2020; Orlikowski & Iacono, 2000). Claims of a coming and predestined future, be it one dominated by entrepreneurship, startups, precarity, markets, or artificial intelligence, fill the pages of even the most neglected corners of the Internet. In reflecting on these claims, Gernot Grabher and Jonas König (2020) shine a light on an important and often underacknowledged dimension of the future of work and organizing: that it is produced (Beckert, 2016; see also Bourdieu, 2000; Emirbayer & Mische, 1998; Tavory & Eliasoph, 2013), rather than an inevitability of the flow of history (Arendt, 1959). In particular, they focus on the role that digital platforms[1] play in producing this future. They depict these platforms as intervening in the extant social order and evoking new arrangements amid market and state structures that have been primed to receive them well: a description that strongly alludes to, and which scholars might gloss as, these platforms' performativity (e.g., Callon, 2007; MacKenzie & Millo, 2003; Muniesa, 2014).[2] Grabher & König (2020) thereby attempt to break the veneer of objectivity which often accompanies perspectives on the future: an excellent foundation for interrogating how platform models construct potential futures.

Building on this foundation, we suggest an addendum. While Grabher and König acknowledge the influence of technologies, markets, and the state on society, and also admit that institutions like the state may contest platforms and the transformations they produce, we draw attention to how society is not only a recipient of, but also a participant in, these changes. Specifically, we highlight the people on the ground who constitute society, and receive and live through platformization. These people — though often overlooked by scholarship on organizational and institutional change (Hallett et al., 2009) — deploy, use, and realize these platforms. In other words, they may agentically react to these "occasions for structuring" (Barley, 1986), in ways that produce variance in what the future may look like.

In this brief essay, we map out the specifics of our theoretical extension. We describe literatures across the field of work, organization, and technology studies which have advocated for looking at people, and flesh out the analytical approach they propose. We then present various instances of its empirical manifestation, marshalling the insights of a set of field studies which have alluded to and witnessed related practices in the wild. In doing so, we ground and concretize our discussion, demonstrating specific ways by which factoring in this extension might enrich Grabher and König's (2020) analysis. Our ultimate aim is thus to not only build on, reconsider, and extend Grabher and König's framework, but to also provide a theoretical

1. Grabher & König's (2020) usage of the term "platform" spans from gig-economy platforms to large Internet companies like Google or Facebook. Tartleon Gillespie (2010, p. 349) points out that like other structural metaphors, "platform" carries a "semantic richness" which allows it to resonate with meaning across the semantic categories of architectural, figural, computational, and political application. For our purposes, we use "platforms" primarily in the computational sense, i.e. "an infrastructure that supports the design and use of particular applications, be it computer hardware, operating systems, gaming devices, mobile devices, and digital disc formats."

2. While Grabher & König (2020) do use the term "performativity" in their article, they use it to describe mechanisms behind the economy's receptivity to platform futures, and not to frame the role of technologies in shaping social worlds. However, Grabher and König's overall description of how the future is produced resembles performativity, as described above. Of note, Grabher and König discuss extant market and state structures in ways that resonate with an overlooked, though absolutely crucial, piece of theories on performativity: the fact that nonhuman actants (e.g., models, technologies) can perform social orders only when existing structures are organized in such a way as to receive them well (Callon, 2007). This attention to extant structure, in part, is what separates performativity from theories on self-fulfilling prophecies (Merton, 1948).

framework of our own: one that shifts our attention from platforms' performativity to what we refer to as people's performances, in ways that we hope will provide fresh insight on how the future is produced.

2 An Alternative Lens: From Performativity to Performance

Gaining an understanding of how platforms may change the world requires that we also look at how people experience the dramatic institutional changes in work and organizing that these platforms evoke. A variety of literatures engage in this project. For instance, the inhabited institutions perspective (e.g., Barley, 2019; Bechky, 2011; Hallett & Ventresca, 2006) has noted that the meanings that people attribute to change may have important implications for its perceived legitimacy, and thus how widely (and deeply) field-wide transformations spread (e.g., Lee & Bechky, 2020). The interactionists (e.g., Blumer, 1969; Goffman, 1959; Tavory & Fine, 2020) have likewise pointed to how social orders are constantly negotiated among their members, and how attention to the full range of interactants may have important implications for how social orders play out and transform. Even further, the social construction of technology perspective (e.g., Bijker et al., 2012; Oudshoorn & Pinch, 2003) has explained how technologies do not unidirectionally affect social worlds or necessarily move on their own, but are influenced and intimately shaped by the people that develop and use them.

Applied to platforms, these literatures shift our attention from technological performativity toward what some past scholarship (e.g., Stark, 2009; 2017; 2020) labels as people's "performances." This lens calls attention to people's astounding capacity to encounter, reflect on, and actively deal with (see also Hodson, 2001; Simpson, 1989; Vallas & Christin, 2018) the uncertainty of how their world is changing. It thereby allows for people's ability to co-exist with and answer technologies' performativity with appraisals of and responses to the worlds these technologies adumbrate. And in so doing, this lens can help draw attention to how people creatively interact with and work alongside the nonhuman actants that populate and shape our worlds, in ways that can help carve and/or clog the future. Essentially, this lens — and the variety of literatures that allude to it — point to the possibility that people on the ground will respond to prompts from nonhuman actants and structures around them, in ways that may fundamentally shape these prompts' effectiveness at performing social orders.

3 Empirical Manifestations: Performances in the Wild

In the next section, we review recent literature to gather several on-the-ground behaviors which exemplify the performances of people working with, for, and against technologies, illuminating some of the ways people help produce our future(s) of work and organizing: our capacity for innovation, articulation, and opposition.

3.1 Innovation

One part of the production of the future has been innovation: instances where people have been creatively inspired by their experience working alongside and with platforms, motivating their reflexivity and stimulating their ingenuity in ways that ultimately produce novel solutions to problems posited by their work. In a series of studies, Daniel Beunza and David Stark (e.g., Beunza, 2019; Beunza & Stark, 2004) explore this while studying the work of bond traders. These traders extensively use platform technologies, such as their Bloomberg terminals, and

the financial models these platforms produce to access the market (see also Knorr Cetina & Bruegger, 2003) and deduce the vagaries of the financial future. However, intuiting opportunities within these markets — a central part of their work — requires that traders actually *not* perform precisely what their technologies and models recommend. Arbitrage instead demands that traders look at these platforms' blind spots, and take advantage of the areas that the models they are exposed to may have overlooked: it "requires another cognitive process that we can think of as re-cognition (making unanticipated associations, reconceptualizing the situation, breaking out of lock-in)" (Beunza & Stark, 2004, p. 373). In other words, these models and the markets they represent induce reflexivity: traders must step out of the patterns recommended by their Bloomberg terminals or the Black-Scholes equation. And given that they must imagine and enact innovative ways of approaching markets, traders produce the future by not only relying on the use of platforms, but also flouting such platforms. Financial trading thus provides an intimate look into how platform technologies may not determine the future, but rather are subject to the innovations of those inspired by them to help determine what the future might be.

3.2 Articulation

Another part of the production of the future has been articulation: instances where people have actively worked to integrate platforms into the flow and texture of everyday life, thus allowing these platforms the impact that otherwise would not be possible without this hidden human labor (Jackson, 2014; Star & Strauss, 1999; e.g., Elish & Watkins, 2020). In other words, workers play a crucial role in co-creating the new worlds of work that these platforms attempt to usher in. Workers on the micro-task platform Amazon Turk maintain a suite of tools outside of what the platform offers, including third-party vendor management platforms, Excel spreadsheets, and technologies for social and peer support: all marginal and often invisible tasks that are nonetheless critical to them being able to do their work effectively, and that are crucial to the continued effectiveness of the platform at producing high-quality work for clients (Gray & Suri, 2019). In another example, gig-work drivers in Jakarta have built richly populated labor networks to share informational and emotional support (Qadri, 2020). This allows them to work around the fact that their daily experience of work often leaves them atomized and individuated, instead helping them to figure out how to navigate the platform and maintain their motivation to stay on it in ways that ultimately scaffold the platform's success at providing rideshares for users. And in a suburb outside Chicago, delivery drivers for Amazon, reverse-engineering the platform's location-based methods for assigning jobs, have begun to hang their phones in trees, in what AI researcher Meredith Whittaker (2020) has called "folk tradecraft." Doing so allows them to not only get around some of the technical shortcomings of the platform in assigning work (and get more work), but also provide the kind of rapid service that users have come to expect from Amazon and prop up its reputation.

Another area of articulation work revolves around the emerging phenomenon of biometric security. Given that platform-based gig work operates without human managers or keycards needed for access, platforms are beginning to explore the use of facial recognition as a form of identity verification. For instance, Uber and Amazon have both begun asking for "selfies," which workers are required to submit to the platform before they can log on to the platform and begin working. However, as Elizabeth shows in a series of studies (Watkins, 2020a; 2020b), the technology often fails: drivers on ridesharing platforms are locked out of the platform due to system errors. Over a third of drivers (38%) surveyed report that the technology breaks down

frequently. And in order to survive, drivers have had to try and repair these system breakdowns. Specifically, drivers have often found workarounds, with some showing the camera an image of themselves using another object such as a printed-out photo or a photo on another device. And in thereby gaining access to the app, these drivers participate in articulation work: they not only gain access to the app in ways that enable them to do their job and allow for their own survival, but also get the platform to work and provide the kind of service expected from prospective clients. Social worlds are ultimately determined, not solely by platforms, but by the local interactions between the technology and the workers, who do the labor of repairing these technologies' shortcomings. Workers provide the hidden human labor that bridges between these technologies and their social worlds, making possible (or, articulating) the disruptions they attempt to evoke (see also Irani & Silberman, 2013; Rosenblat & Stark, 2016).

3.3 Opposition

Yet another part of the production of the future has been opposition: instances where people have pushed back against platforms, in ways that contest and thereby shape visions of how our social world should look. Kate Kellogg, Melissa Valentine, and Angèle Christin (2020) provide a compelling framework by which we might look at such contestation. Notably, they introduce the notion of "algo-activism" to elucidate the variety of ways that both individuals and collectives have resisted the rise of algorithmic technologies. In one compelling empirical manifestation of this, many have criticized the technocratic values of software companies, as codified into their products and used the world over, for producing objectionable futures. For instance, Safiya Noble (2018) writes about accusations against Google of racism and inattention to the dignity of racial minorities. Specifically, she notes that internet searches through its platform, using the search term "Black girls," elicited pornographic results. And in following the public outcry that ensued throughout the early 2000s, Noble writes that Google reshaped its platform, carving out an alternative future for its participation in age-old social and racial inequalities. And carrying this same spirit forward, activists have recently begun agitating against companies producing facial recognition services for commercial and state-based application: services which have been shown to function poorly when shown images of Black, Indigenous, people of color (BIPOC), and in particular women of color (Buolamwini & Gebru, 2018). Consequently, a number of cities around the United States have either banned or placed restrictions on the use of facial recognition by public entities, such as police departments.[3]

In another example of platform contestation, Kevin interviews music composers, as part of a broader ethnographic study on a startup developing an artificially-intelligent digital platform that composes music (e.g., Lee, 2020). He discovers that some music composers have opposed artificial intelligence's rise across their industry. They have pointed not only to the threat that artificial intelligence poses to their livelihoods, but also to its violation of their community's values: their commitment to music's human touch, and to their craft as an intimate form of human expression. Consequently, many composers have resisted by blocking the rationalized futures that artificial intelligence promises: some composers have vehemently refused to use artificial intelligence in their work, and have passionately critiqued people — including members of their own community — who do. And while Kevin discovers vulnerabilities in this community's opposition — namely, composers' willingness to automate forms of their work which they view as less valuable, interesting, and human — even their acquiescence is an active

3. The advocacy group Ban Facial Recognition has created a website cataloguing the state of facial recognition legislation across the United States, available here: https://www.banfacialrecognition.com/map/.

accomplishment. It is constituted by their ability to appraise oncoming technologies in light of incumbent values, and to consent only when these technologies allow for desired futures. So-called deterministic technologies are thereby met with human agency, in ways that can oppose and shape the social worlds that might otherwise proceed from these technologies.

4 Conclusion: Performances in a Performed Society

Our essay began by praising Grabher & König (2020) for drawing attention to the various ways by which the future of work and organizing is produced, while also suggesting an addendum: a close look at the people living through and experiencing platformization, pointing to the potential salience of people's performances in the face of platforms' performativity. And by showing how people might innovate, articulate, and oppose platform futures, we show a handful — though certainly not an exhaustive list — of skilled performances that people engage in, and which, in conversation with platforms, have a strong influence on what kinds of futures are produced. We believe this extension can enrich the analytical and predictive power of Grabher and König's framework. Moreover, we provide the beginnings of a theoretical framework of our own — namely, a sociology of people's performances and their role in future-making — which we believe can contribute to and play a role in framing ongoing discussions on the future of work, organizing, and society.

Such discussions have long been core to our mandate as sociologists; the discipline began by studying the dramatic transformations in work, organizing, and society that wracked the Western world at the dawn of the twentieth century, ranging from the rise of bureaucracy to the increasing division of labor to the disorienting advance of urban life. Moreover, contemporary scholars — confronting yet another set of major transitions in work, organizing, and society — have faced "the same challenge that confronted the field's founders: the need to develop images of organizations that are congruent with the realities of work in a new economic order" (Barley & Kunda, 2001, p. 77; see also Barley et al., 2017; Bechky, 2011). If anything, recent events have made this call all the more important and urgent. Ours is an exciting, if often terrifying, age (Phillips, 2020): one wracked by the rise of political populism and polarization (Hochschild, 2016), the passionate protest of age-old social inequalities (Lamont, 2018; Milkman, 2017), the birth of technologies beyond our predecessors' wildest imaginations (e.g., Beane, 2019; Sachs, 2020; Shestakofsky, 2017), and a global pandemic (Esposito et al., 2020), the likes of which have not been experienced in living memory.

Amid all these dramatic changes, it is perhaps tempting to envision ourselves as caught up in institutional transformations beyond our will, control, or intervention. Adopting this perspective of powerlessness absolves us of the anxiety of responsibility for these transformations. Given the sheer amount of anxiety that defines our modern era (e.g., Weber, 1904), such a respite from anxiety may be welcome, if not actively sought out. However, adopting this perspective also willfully forgets our collective capacity to confront structures, be they organizations, technologies, ideologies, or political leaders, among others. It erases our important role in how our societies come to be, undermining the energy, optimism, and passion required for an active citizenry and healthy democracy (Arendt, 1959; Tocqueville, 1835). Acknowledging our capacity for skilled performances in such a chaotic and contested world thus becomes far more than an analytic or academic exercise. Rather, this acknowledgement holds within it the weight of our lives and possible future(s): our ability to provide "unsponsored analysis of the social arrangements enjoyed by those with institutional authority" (Goffman, 1983, p. 17), to

unveil the fragility of the structures that attempt to shape who we are, to mobilize hope, and to inspire attempts at harnessing the flow of history.

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Share vs Platform Economy

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Abstract

This commentary on the article by Grabher and König focuses on the controversy in the literature between "sharing economy" and "platform economy". In light of the theoretical and historical perspective expressed by Karl Polanyi in his classic *The Great Transformation* and adopted by the two authors, sharing economy can be interpreted as an attempt of a resocialization of the economy, while platform economy seems to fully realize what Polanyi calls the "market society". Grabher and König rightly criticize Polanyi's "double movement", but, in our opinion, they do not draw all the consequences of their criticism. In fact, the theoretical structure they propose fails to explain the reasons why the 1929 crisis was followed by a process of re-embedding of the economy through state intervention, while after the 2008 crisis this process did not take place and the neoliberal model continued to rule the society. Indeed, with the diffusion of the platform economy this model has been further strengthened. Nevertheless, we still believe that digital technologies are in themselves open to different forms of underlying social relations and internal governance. Therefore, it is on such relationships that theoretical attention and political action should be focused. A movement that intends to change the present situation can effectively leverage the new technologies, by guiding them towards reciprocity relations capable of revitalizing the civil society and the internal cohesion of the democratic state.

Keywords: Platform economy; sharing economy; Polanyi.

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There are terms that owe their success to the semantic ambiguity that characterises them, that in the social imaginary count more for what they hide than what they reveal and, thanks particularly to that ambiguity, are destined to tell the story which defines an era. And it has been so — as noticed in Pais & Provasi, 2015 — for the term *sharing economy*, and it risks being so now for the term *platform economy*. According to Gillespie the term *platform* has gradually become established in the digital world (but not only in that one) because along with the support that it gives, the platform "raise[s] level surface" (2010, p. 350), allows one to start off from a higher technological level, saves on resources, suggests also a lack of constraints imposed on what will be built "on top" of it; it highlights the openness to a wide range of possible solutions and the synergies that it encourages — in a word, its *neutrality*.

It is understandable how the term *platform economy* has taken root in recent years far beyond the web broadcasting sector taken into consideration by Gillespie in the above-mentioned article (2010), up to the point where it became an emblematic category of a way of working in the digital economy, an alternative to the idea of *sharing economy* widespread up until some years ago to define the same phenomena. Grabher & König very helpfully pick up on the change in register in their article in *Sociologica*, referring to a "sharing euphoria" which has left more and more room for "platform disillusions" and opposing the social values of sharing and the idea of an alternative to the market economy of the former, to the "compulsive" logic for ever-increasing profit under the sign of a neoliberalism which has become (if at all possible) ever more exasperated than the latter (2020, p. 96).

In some of the most notable considerations that have been made in recent years (see Zuboff, 2019) the platform economy has taken on the meaning of a veritable form of regulation or development model for the whole economy (digital and not). The large online multinationals (starting with the US "GAFAM": Google, Apple, Facebook, Amazon, Microsoft and the Chinese "BAT": Baidu, Alibaba and Tencent) condition the whole business world with their pervasiveness and power, needing digital visibility to sell and compete in the global economy and they depend increasingly on the services (cloud, intelligent management of the supply chains, e-commerce, logistics) of the large global platforms. They moreover have learnt over the last few years how to develop real "ecosystems", by exploiting the synergies of the multi-sided markets, the potential for growth in complementary markets and the positive network externalities. They have become, above all, owners of enormous amounts of data, often conferred unwittingly by the end users in exchange for largely free services, used for forecasting and marketing purposes by the platforms themselves and by the companies who are willing to pay for it. To complete the picture, platforms developed the capacity to attract from the outset huge venture capital investments and then become self-financing corporations thanks to cashflow and an unprecedented capitalization of the stock exchange. Zuboff (2019) highlights the social consequences "of surveillance" of this capitalist model, but it is certain (even if not completely agreeing with Zuboff's panoptic vision) that there is a question of innovation which it is not exaggerated to define *disruptive* compared to previous business models.

Grabher & König (2020) believe that to understand this radical change in economic paradigm, they can usefully use the theoretical framework used by Karl Polanyi (1957) to interpret the "great transformation" that took place in the late 19th and early 20th century following the Industrial Revolution. But they do so with a reconstruction of Polanyi's thought which is unusual regarding its most established interpretations. Indeed, in recalling the cornerstones of his thinking — that there cannot be a market which is totally *disembedded* from underlying social and political relations and which an excessive movement of *commodification* activates a *counter-movement* of re-politicisation and re-socialisation of the economy — they

reinterpret, at least in our opinion, his thinking in ways that are closer to theories (like that of Kondratieff & Stolper, 1935) on the relationship between technological innovations and the long-term developments of the economy (Perez, 2009; Mason, 2015). They propose an interpretation of Polanyi which identifies the turning point in modern economic history not as the advent of capitalism as much as industrial mechanization. The latter, and not capitalist accumulation, would seem to be the driving force of the process of liberal marketisation. According to Grabher & König (2020), Polanyi dates the emergence of the market economy back to a complex alchemy of political, social, institutional and technological ingredients. The markets did not simply represent the outcome of a natural predisposition to the individualistic massification of use, as the classic economy maintains. But rather, they were the manifestations of a complex interaction between the opportunities offered by technology, the performative effects of science and deliberate efforts to provide regulatory institutions consistent with those. But in the end, it would still be technology to command and not capital with its economic and social power relations.

Leaving the task of an exegetical evaluation of this reading to the scholars of Polanyi's thought, and giving Grabher and König the possibility to specify their position on the matter in their reply, here we limit ourselves to recalling the consequences on the interpretative system put in place by the authors. This is formulated through a threefold analysis that is applied in parallel both to the Polanyian great transformation and to the one of the platform economy and it is based on technology, science and the state. If the great transformation that followed the industrialization of the twentieth century was based on the opportunities offered by mechanization, on the performative vision of political economy and on the complementarity between *liberal governmentality* and the market, the great transformation of these years has been organized around a technological infrastructure built on data, on the dominant and transversal paradigm of network analysis and on a new way of *managerial governmentality*.

In this reconstruction, automatic data processing technology takes on the role of process driver, increasing the efficiency of market transactions to an extraordinary degree and, above all, transforming the fabric of social relations into data that can be captured and processed by large digital platforms for use or resold for marketing purposes. The data are, according to Grabher & König (2020), to all intents and purposes similar to Polanyian fictitious commodities (land, labour and money), insofar as they are not "products for sale" but put on the market following a process of *enclosure* by digital platforms (the "second" after the primitive one of Marxian memory). Network analysis has thus become the dominant scientific paradigm, transforming social relations into nodes and ties of a network, encouraging their translation into automatically processable data and imposing the *networked ego* of social network analysis instead of the *homo economicus* of political economy. Above all, the notion of network plays an "ideological" function (at the origin of the same narration of the sharing economy), suggesting a sense of social sharing among the end users of the platforms, even if they share little more than the software application that manages their online interactions. Finally, the fundamental role of the state as regulator of the market also undergoes a significant twist with respect to the liberal tradition of the past. Governments seem to be subjugated by the sociotechnical complexity of digital infrastructures and end up delegating the (self-)regulation of the platforms to platform managers, encouraging the emergence of large private powers with a total lack of any public control.

Grabher & König's (2020) paper, in an overview inspired by Polanyi's historical and theoretical perspective, is full of interesting suggestions and useful indications. At each of the three levels of the above-described structure, the proposed ideas open up further promising paths

of research: the idea that data today is a fictitious commodity like Polanyi's three classic ones, or the performative and not merely descriptive nature of network analysis, or finally the indication that managerial governmentality, imposed by large digital platforms on governments, marks a clear discontinuity with respect to the liberal-democratic structure of the past. And yet it seems to us that it fails to respond convincingly to the question from which it starts: to settle the dispute sharing vs. platform. More precisely, even if it seems to take the side of a market economy dominated by platforms, this position does not find a persuasive foundation in the argument. There must be some reasons for this, and we would like briefly to spend some time on this in the rest of this review.

The most problematic point from which we should start is Polanyi's *double movement*. We can share the criticism that Grabher and König make regarding Polanyian mechanistic conception of double movement, as if the process of *commodification* consequent to the needs of the industrial revolution generated in itself an automatic reaction of the state. This is a conception that, according to the authors, overlooks the fact that the political forces that oppose the market are not in themselves always progressive and can jeopardize the social dimension also because of an excess of the redistributive mechanisms of the state. And yet the structure proposed by Grabher and König fails to draw all the possible implications from this well-founded criticism, in particular that behind these movements (of dis-embedded and re-embedded) there are obvious power relations. Of the three levels of their theory, the least developed is the one related to the state and the different forms of governmentality that have distinguished it. The differences between the liberal governmentality of the first great transformation and the managerial governmentality typical of the transformation of recent years are only hinted at in their distinctive features and it is not clear whether the latter form can be traced back to the principles of neoliberalism at the level of government, or whether it is a completely new form (as Zuboff, 2019 seems to suggest).

But the crucial question that we would have expected in the sharing vs. platform debate is: why does the counter-movement occur so strongly after the crisis of '29, by means of Keynesian and welfare state policies, and it is not present at all after the subprime crisis of 2008, which was just as disruptive as the one in '29 and which marks the maximum manifestation of neoliberal dis-embeddedness? This question has been answered differently by many scholars who have measured themselves with the resilience of neo-liberalism, despite the crisis; none of these responses, however, can be taken into account by Grabher and König's framework, which, with the analytical distinction of the three factors mentioned above, end up rather losing Polanyi's *double movement* and the power relations on which it is based.

A first possible answer, shared by many scholars (among others Arrighi & Silver, 1999; Streeck, 2014), is the one that sees globalisation as the main reason for the loss of effectiveness of the economic policies of nation states and within them, of the (market and political) bargaining power of workers due to the pressure exerted by the emerging countries' labour markets. A second response insists rather on the ability of large corporations to exert influence on governments, both by threatening to leave the country in the event of the adoption of policies which go against their interests and through the more or less lawful financing of parties and their leaders (Crouch, 2011; Reich, 2015). A third response looks mainly at the forms of government of democracies and the shift of political power from parliaments to governments and above all to independent technical authorities (often supranational: IMF, World Bank, WTO, ECB, etc.) which apply market principles to public decisions (Rosanvallon, 2011; Ferrarese, 2017). This trend goes hand in hand with the growing power of finance, not only in economic matters but also because of the political conditioning that it exerts through the financing of sovereign debt,

to the point of assuming in some circumstances and for some countries a substitute function for the sovereignty of the state itself.

Now these answers, which have been around since the 1990s, are further enhanced by the emergence of the platform economy. So it is for the process of globalisation, especially for the emergence of global platforms acting as intermediators in work, be they *online*, i.e. not taking on the physical presence of the worker (as in the case of intangible professional work) or *mobile*, i.e. requiring physical interaction and consequently a specific location of the operator (mobility and logistics services, domestic cleaning, personal care) (Codagnone et al., 2016). If perhaps for the first time in the history of mankind the former allow for the radical transformation of work into a totally "liquid" commodity, even the latter make it inexpensive for those in control to "exit" from a local market if the labour protections imposed by the state are not appreciated (as in the case of Foodora, which first threatened and then abandoned the Italian market stating that this was due to the lack of changes to labour regulation). Finally, the technical-financial dimension is also strengthened by the economy of the platforms, and not only for the increased role played by managers in their self-regulation, but also for the function of speculative capital in financing their growth, with the consequence — also highlighted by Grabher & König (2020) — of the *winner-take-all effect* and the emergence of large monopolies which are difficult to regulate and are indeed able to exert a great influence on the governments themselves.

These are answers that are not necessarily mutually exclusive and that appropriately place the difficult power relations that characterise contemporary reality at the center of the analysis. And yet they lack a convincing interpretation of the reasons for the crisis of legitimacy that the liberal-democratic nation states are experiencing. These are forced to rely on governments and independent authorities that are less permeable to democratic pressure, while they are excessively accommodating towards strong economic powers, mainly because of the intrinsic fragility that results from the fragmentation of the constituencies that have governed the political dialectics of the past. The same process of globalisation — with the regulation in favour of capital mobility and the lack of attention towards social dumping of emerging countries and the permissive policies of the so-called tax havens — was certainly started under the pressure of large corporations, but above all from the growing political difficulties that developed countries experienced in the second half of the 1970s. It is not possible here to go into the causes of this condition (see Provasi, 2019); suffice to note that the private power of the large platforms (the managerial governmentality in Grabher and König's analysis) is part of the situation of the intrinsic weakness of states in governing a fragmented multitude of *networked egos* shut inside their own individualities.

These trends are therefore part of the underlying neoliberal paradigm, that seems to be able to express itself at its maximum through the platform economy, more than in the establishment of digital technologies in itself. However, these technologies are open to different possible forms of social relations and internal governance. In our previous article (Pais & Provasi, 2015), using Polanyi's contribution to which even Grabher & König (2020) refer, but interpreting it by starting from the three forms of integration (exchange, redistribution, reciprocity), we tried to distinguish different types of use of web technologies starting from the underlying social relations.

One of these possible uses is characterized by the exchange (market) form. When we wrote that article the platform economy was not yet so widespread; however, we were beginning to guess that platforms could enhance even more the existing commodification (through the on-demand, retail and the gig economy). It was, if anything, the commercial use of the collected data which at that time was still largely neglected and which has today become prevalent for

the new business models. But alongside the exasperation of the exchange form made possible by digital platforms, there are other possible types of use of web technologies from different underlying forms. In particular, we focused on the different forms of reciprocity from simple collaboration, typical of the experiences of collaborative consumerism, to the real production of common goods with shared ownership, such as for free or open source software (for a classification, which in part overlaps with what we proposed and which appropriately leads the platform model to one of the forms of coordination proposed, see also Loveluck, 2015).

The form of reciprocity — neglected by Polanyi, which in the great transformation mainly focused on redistribution policies aimed at rebalancing the excesses of the market and relegates reciprocity to the exchanges of primitive societies as well as to the domestic economy — today assumes a particular function to reconstitute the ethical and social fabric that the market, on the one hand, and the state, on the other, have contributed to deteriorate during the modernity. We continue to believe that, despite the literature's oscillation between share vs platform economy, to which Grabher & König's (2020) article also bears witness, web technologies can offer opportunities for a different form of social relations and regulation, which were previously unimaginable.

The impact of the platform economy on Polanyi's forms of integration can in fact be traced back to two different processes: (i) the strengthening of the extreme traits of each pure form; (ii) the hybridisation between the three forms for a different model of integration and social regulation. Scholars to date have focused mainly on the first process and, in particular, on the exchange form, with the criticism of "*neoliberalism on steroids*" (Murillo et al., 2017) driven by the platforms. But the contribution of Grabher & König (2020) also appropriately mentions the implications of managerial governmentality; this is an intuition that could open new paths of analysis with respect to the implementation of digital platforms in the sphere of redistribution, a largely unexplored empirical field up to now. As far as reciprocity is concerned, the platform model seems able to overcome the limits of face-to-face reciprocity and allow for a strengthening of *generalized reciprocity* (Sahlins, 1972). These possibilities were demonstrated during the recent pandemic crisis with the financing on the GoFundMe platform of 1,579 social campaigns in March 2020 alone (Rajwa et al. 2020).

With regard to hybrid models and, in particular, those based on forms of extending reciprocity in the direction of the market, the platforms have so far struggled to express their potential. The "marginal" nature of these forms is what makes them so original and is at the same time their main limitation. In fact, they have often been "swallowed up" by the market logic of corporations that frame themselves as social movements (Slee, 2017). Operations that have been rightly denounced as "sharewashing" (Belk, 2017), which correspond to similar rhetorical strategies by consumers, adopted "in order to feel better about their consumption" (Belk et al., 2019, p. 6). But they also received criticism from those who had expectations of expanding Polanyi's concept of reciprocity to digital communities based on communality and non-commercialized reciprocal relations (Sahakian, 2017; Laamanen et al., 2018) and as a response "to neoliberalization as its counter-movement with its own practice and morality" (Laamanen & Wahlen, 2020, p. 50) but were forced to recognise the failure of these forms of everyday resistance practices (Suetzl, 2019).

It is still too early to understand whether the pluralism of different logics inherent in hybrid models leads to tensions (Johnsen & Waldorff, 2017) that compromise their institution (see, for example, Valor & Papaoikonomou, 2020, with reference to the case of time banking) or whether the current fragility of these models depends on the latency of innovative social movements (Melucci, 1996), so that they can gain strength again as a result of the shock caused

by the pandemic, encouraging the spread and consolidation of "moralized markets" (Balsiger, 2019). What is certain is that for this to happen, profound changes are needed not so much in digital technologies as in the underlying social and political forms: a significant movement of social innovation is required, one that can benefit from the opportunities offered by the new technologies but able to inform them about different principles.

In conclusion, we limit ourselves to briefly mention three aspects on which we believe such a movement should focus. First, on data ownership. This issue has to go beyond the current debate on privacy and involves a radical rethinking of the business models on which large platforms are currently based: reduction of the weight of advertising aimed at feeding debt-financed private consumption that is stretched beyond reasonable limits; anti-monopolistic policies that break the logic of the *winner-take-all* economy; control over the instrumental commercial use of personal data by platforms. These are policies that primarily involve the regulatory powers of governments and independent authorities, but which can count on significant alliances that a conscious and determined movement could aggregate.

Secondly, it is a question of reorienting web technologies from the commodification of social relations to instruments of possible reciprocity. The problem does not concern the technologies themselves, which as such are perfectly able of acting as sophisticated tools of interhuman communication, but rather the underlying dynamics. This is the most demanding challenge, the real terrain on which social innovation is played out, because it requires that at the level of daily behaviour people modify their behaviors, which are today mainly defined by individualistic market relationships. The signs in this regard (as mentioned above and as we already noted in Pais & Provasi, 2015) are mixed: not only some (in truth only a few) achievements of the sharing economy, but the entire social economy (now growing from cooperatives to benefit companies, from volunteering to institutional philanthropy) indicates that relationships different from the market are possible.

Finally, it is necessary to be aware that exchange (market) and redistribution (state) will continue to be decisive forms of regulation of developed societies in the future. Reciprocity — facilitated also by the network technologies — could, however, provide an essential space for experimentation of new relationships and for the revitalization of civil society. The awareness of the limits of the current model of development and its unsustainability in the medium-long term (accelerated also by the pandemic that has profoundly affected the whole world) may perhaps be able to start a process of radical innovation where the subprime crisis has failed.

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Transformation or Structural Change? What Polanyi Can Teach Us about the Platform Economy

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Abstract

The rise of the platform economy marks the latest phase in the ongoing digital revolution. Indeed, the platform is to this digital era what the factory was to the industrial era, both a symbol and an organizing mechanism. Gernot Grabher and Jonas König (2020) used Karl Polanyi's analysis of what he termed the "great transformation" to frame the rise of platform economy. The platform economy is remarkable as it confirms Polanyi's (and Marx's before him) insight that the reach of the market is based upon increased commodification as it has been able to reach into ever more parts of social life. We introduced the term "platform economy" in 2015 because we recognized that the digital platforms were changing the dynamics of capitalist accumulation —- an analysis framed by regulationist school of political economy. The intuition was that the socio-technical innovation of digital online platforms was the critical fulcrum for an economic restructuring that would rewire the flows of data and ultimately money and power. The firms we have termed the "mega-platforms", Apple, Amazon, Facebook, Google, and Microsoft, have become the most valuable and powerful firms in the world. Importantly, the reach of these platforms is global and yet local and personal. Moreover, this platform power has only been reinforced during the COVID-19 pandemic.

Keywords: Platform Economy; Platforms; Polanyi; Power; Amazon; Google.

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The rise of the platform economy marks the latest phase in the ongoing digital revolution. Indeed, the platform is to this digital era what the factory was to the industrial era, both a symbol and an organizing mechanism. Gernot Grabher and Jonas König (2020) have used Karl Polanyi's analysis of what he termed the "great transformation" to frame the rise of platform economy. In 2015, when we introduced the term "platform economy" in a Berkeley Roundtable on the International Economy working paper, our thinking was framed by regulationist school of political economy. Unbeknownst to us, almost simultaneously, Nick Srnicek (2017) was developing his formulation of platform capitalism.[1] We decided to use platform economy, rather than platform capitalism, in part due to our belief that the critical economic changes were not the establishment of firms that used online websites for "sharing" or creating "gig work." Such firms were and are, in fact, rather small and are not expressive of the key transformation, which was that platforms were becoming extremely powerful organizers of enormous swaths of economic activity — a point we return to later.[2]

The intuition that it was the socio-technical innovation of digital online platforms that was the critical fulcrum for an economic restructuring that would rewire the flows of data and ultimately money and power, is proving to be correct. The firms we have termed the mega-platforms, Apple, Amazon, Facebook, Google, and Microsoft, have become the most valuable and powerful firms in the world. Moreover, their power has been reinforced during the COVID-19 pandemic (for a reflection on this, see Kenney & Zysman, 2020b).

The platform economy is remarkable as it confirms Polanyi's (and Marx's before him) insight that the reach of the market is based upon increased commodification as it has been able to reach into ever more parts of social life. Similarly, these digital platform firms built upon the already existing communication networks — especially through the smartphone. They have been able to extend to approximately three billion people — all of whose actions are, in principle, open to commodification and monetization.[3] Thus, the reach of these platforms is global and yet local — a feature that we return to later.

These platforms control access to customers in the case of Amazon, Apple, and Facebook. In the case of Google, they control discoverability and thereby access to potential customers (Kenney & Zysman, 2020a). Consequently, they have become intermediaries that can tax transactions even at the local level, when a customer searches for a restaurant or any other service. Effectively, they become the market. For us, this is a significant structural change in the market society that Grabher & König (2020) capture well. In fact, going further platforms increasingly are the environment within which entrepreneurs both start new businesses and operate old businesses, something that we have termed platform-dependent entrepreneurship (Cutolo & Kenney, 2020).

One of the key points in Polanyi's transformation was, of course, the commodification of labor. One of the important insights of Grabher & König (2020), which builds upon earlier work such as Terranova (2000), is that data, much of which is produced by user's actions using the platform, has become another "fictitious" commodity underlying the value of all of the platform firms. We share their belief of the critical importance of data, of which software pro-

1. Morozov (2015) mentioned the term "platform capitalism" in an editorial in the *Observer*.

2. We fully agree with Van Dijck et al. (2018) that these platforms are also becoming critical organizers of sociality writ large. In fact, the current mania about how platforms are or are not responsible for the rumors or spurious information, sometimes, referred to as "fake news" suggests that their influence as media of communication is as profound in areas such as politics (Gillespie, 2010).

3. For a prescient discussion of the development of the networks that underlie these platforms, see Castells (1996).

grams are the machines built to process this data. And yet, human labor, both the "free" labor that is provided as we use websites such as Facebook, Google and many others and the labor at the platform firms and by those in the platform ecosystem. In a series of papers — Kenney & Zysman (2019) and Bearson, Kenney, & Zysman (2019) — we created a schematic taxonomy of the types of work (perhaps better thought of as "value creation activities") undertaken in the platform economy.[4] As Polanyi observed, labor had to be transformed into a commodity, but Marx 100 years earlier suggested that, more important, was the ability to extract value from that labor. Our taxonomy considers the remarkable complexity of the ways that labor is organized and compensated for generating the value captured by the platform firms. It is through the lens of this work that we approach and reflect upon their contribution.

1 Polanyi's Great Transformation

As Grabher & König (2020) suggest, Karl Polanyi's (1944) analysis in *The Great Transformation* provides certain "rhymes" that can deepen our understanding of the platform economy.[5] Following on the commercialization of agriculture, the industrial revolution generated inexorable pressure for fundamental changes in the social rules regarding land, labor and money. More specifically, these changes led to the creation of the market economy, to use Polanyi's terms, or Market Society to draw on the language of Robert Heilbroner (1961). Before the "Great Transformation" markets were embedded in society, constrained by social rules, or operating on the periphery of the feudal economy. For example, the Hanseatic league of independent trading cities is an instance of trading communities linking more traditional societies. To illustrate, Tallinn, in today's Estonia, was literally divided into two parts; the upper city containing the German Teutonic knights that owned vast rural estates, and the lower city that had a governing city council appointed from the guilds. One part of Tallinn was a free bourgeois city that operated according to bourgeois rules as part of the Hanseatic league, while the other part was the home of feudal lords whose income was derived from their rural estates. The bourgeois liberation, across societies, was predicated upon land and labor becoming commodities to be traded for money in the market. The capitalist market economy, a society organized around the market, is not an inherent feature of social life, but is, rather, a political creation. Hence, a Polanyian optic draws attention to the fact that the emergence of digital platforms forces consideration of the importance of fashioning new rules and rights as they reorganize activities.

The "Great Transformation" was, of course, not planned, and the creation and legal recognition of these fictitious commodities was the result of a sequence of political fights; from the enclosure movement making land itself a commodity through the Speenhamland, and poor laws more generally, transforming labor into a commodity bought and sold on a labor market. The series of poor laws broke the link for survival between individual and community, making the individual worker dependent on wages obtained in the labor market. At an extreme of

4. For another useful taxonomy, see Schor and Vallas (2020). Where our work differs with them is that we also consider employees and contractors working directly for the platform firm as part of the platform economy. It is particularly important to consider the platform's direct employees as they are a small but remarkably privileged part of the entire workforce (Kenney & Zysman, 2019; Bearson et al., 2019).

5. Polanyi has often been an entry for interpreting the digital era, see, for example, Julie Cohen (2019), who used Karl Polanyi to frame her analysis of what she termed "informational capitalism." John Zysman and Abe Newman (2006) drew a distinction between structural change and Polanyi's fundamental "Great Transformation".

the ideological foundations of the market economy is the Malthusian notion of starvation as a means of equilibrating labor supply and demand. The Great Transformation was, thus, part of a long struggle within which political power shifted from the landed classes to industrial bourgeoisie, though some in the traditional trading bourgeoisie made the transition to industrialists. The rules of property, of course, also evolved during each era of the market economy as they were reshaped by the pressures generated by various changes as social groups, technologies, and methods of creating and capturing value to use the Marxian language came into contradiction with existing norms and laws. The previous coalitions and rules of behavior were changed by the political and economic power being amassed by new groups. This story is well told in many places, and recently by Pistor (2019). In essence, as Steve Vogel (2018) has shown markets can be crafted and recrafted to meet the needs of various social actors.

The platform economy should be seen as another phase in the continuing upheaval and change driven by capitalism and the market economy. While it is unnecessary to debate how profound the shift underway is — the scale in terms of people touched by the digital platforms and the ever increasing reach of these digital platforms into our lives confirms our belief that the platform economy is a new stage in development, perhaps, as important as the rise of Fordism as an organizing logic for the leading edge of capitalism at its time. As summarized below, the remarkable impact the platforms are having across wide swathes of the economy provides insight into their power. These platform firms are also influencing the geography of economic activity. Most evidently, for example, Amazon and other online sales platforms shift sales from retail store fronts and replace those with warehouses located in non-descript industrial parks on the city outskirts (see Kenney & Zysman, 2020a; for Amazon and for a larger geographical perspective, see Kitchin & Dodge, 2011).

As in previous eras, there are continuing struggles over intellectual property ownership.[6] As Larry Lessig (2009) has shown, the ability to separate the informational content from the physical media, i.e. render things into digital representations, means that the cost and ease of copying becomes trivial, thereby threatening property ownership. In the digital era rules for the collection and use of data dramatically increase in importance, because much of the value created is derived from data.

New technologies, when introduced, can overturn previous arrangements or, in the current business vernacular, "disrupt" them. Social scientists have shown that an organization or industry introducing a new product or service must develop legitimacy in the market. The history of the introduction of new products, services, technologies, or even entire social systems is replete with what in retrospect proved to be utopian visions. This can be seen by the belief by the French utopian socialists, Henri de Saint-Simon and Auguste Comte, that the industrial revolution would bring a liberation of human beings from the drudgery of work. Similarly, the initial developers of the personal computer believed that computation would liberate users by giving them calculative power at their fingertips (Freiberger & Swaine, 1984) — they would no longer have to wait in line for the mainframe to process their jobs. Finally, more recently, there was the belief that the internet-based digital technologies would lead to either a libertarian utopia (Raymond, 1999) or a society where open source software and other digital platforms would make possible a new society built upon sharing (Benkler, 2006). And yet, the commercial implementation of these technologies resulted in arguably the largest and most powerful firms in history — something that can be seen in their valuations and their ability to dramatically increase their power in one of the greatest epidemics and fall in GDP in the last 100 years

6. See Jessop (2007) for a Polanyi-inspired consideration of knowledge as a fictitious economy.

(on the COVID-19 pandemic and platforms, see Kenney & Zysman, 2020b)

Perhaps, the finest example of such evolutions from wonderful intentions can be seen how in Google's early days, it adopted the slogan "do no evil". The phrase, of course, was later removed from their code. More recently, social scientists inspired by Yochai Benkler (2006) argued that that a "sharing" economy was emerging, which they defined as "consumers granting each other access to under-utilized physical assets ('idle capacity'), possibly for money" (Frenken et al., 2015). While the greatest attention in the social science discussions has been given to firms such as Blablacar, DiDi, Lyft, and Uber in ride "sharing" or Airbnb in room "sharing", Fitzmaurice et al. (2018) extended the sharing concept to include Maker's Spaces and various other services. However, in the case of the venture capital-financed firms such as Uber or Airbnb what exactly was being "shared" versus being provided in exchange for money is uncertain. The term, nonetheless, was extremely useful when talking to government officials, even as government rules on public conveyances or zoning were being entirely ignored. The business models for these firm transferred risk from the firm to contractor/employee and often included off-loading the costs of capital. It was, in many respects, not the end of commodification, but rather an intensification of commodification (Kirchner & Schüßler, 2020). Despite the language and hopes of some, the notion of the sharing economy was, with a few exceptions, an effort by entrepreneurs to give a social facade to their, sometimes productive, innovations that upset existing market rules. While many have hailed the sharing economy, it is remarkable that most of these proponents do not explicitly consider the costs of regulatory arbitrage, i.e., neither an Uber automobile nor Airbnb has the same inspection regime as a taxi or hotel. Lack of regulation creates significant savings, but does not result in greater efficiency, but rather less regulation.

We introduced the concept of the platform economy to capture the far larger developments whereby digital platforms were becoming dominant economic and social intermediaries (Van Dijck et al., 2018). Polanyi, to play out his logic, argued that the reaction to the social disruptions of evolution of the market society was the development of the Western European social democratic welfare system. The welfare system was meant to reduce the vulnerability of citizens to the market, thereby containing the consequences of the market economy and labor commodification. As an adaptation to the consequences of the market, the welfare system is an effort to cushion the effects of the market, not a change its underlying logic of commodification. From this perspective, the political debates about the rules to be applied to the operations of the platform economy are part of the "second movement," i.e., a reaction to the platform economy.

Already, various reactions have emerged regarding specific manifestation of the platform economy, such as whether in California Uber drivers should be treated as "employees" or "contractors". As Kathleen Thelen (2018) observed in her cross-national study of the regulation of Uber, different countries and, indeed in the US, different jurisdictions have reacted differently to the introduction of specific platform services. In fact, interestingly, as part of the response to the COVID-19 pandemic, some "gig" workers were qualified for federal unemployment benefits (Christensen, 2020). This may be a first step towards recognizing gig work as "normal."

The essay by Grabher & König (2020) suggests that platforms, through the "terms and conditions to which users must agree to for access, and the algorithmic operations of the software have become, in essence, private regulators. In part, they created private worlds where their regulations minimize the purview of the State whose very power was built-up during the

Great Transformation and the ensuring societal reaction to the dominance of the market."[7] In terms of competition, powerful platforms can leverage their existing assets and the potential to build and extend their software to introduce new services or leverage them to enter adjacent businesses.

To illustrate their enormous expansionary potential of the dominant platforms — in Kenney, Bearson, & Zysman (2020a) — we show how Amazon expanded in multiple directions. The most successful of these platforms, such as Amazon, thus become multi-platform hydras that expand both in the expected horizontal and vertical directions, but sometimes expand in unexpected ways. For example, Amazon's decision to purchase Whole Foods was a surprising new vector of expansion or Google's acquisition of Fitbit.

For the state to regulate such surprising and amoeba-like growth is difficult, as the acquisition does not immediately violate concerns about excessive concentration. In other cases, the new service appears basically unannounced and is only noticeable after the market has already tipped in the platform's favor. For example, Google introduced its Drive cloud storage as a standalone service similar to that offered by Box and Dropbox. However, it soon integrated Drive with Docs and created software to allow joint editing of Word documents in near real-time. To this it added Google Forms. The Google Drive case shows how new services can easily be added further expanding the firm's scope. This ease of expansion means that entry into both existing markets and creation of new services/markets can happen rapidly and the "competitive" phase can conclude prior to incumbent firms responding or governments fashioning, or even considering, regulation.

In contrast, to the industrial revolution where the capitalist moved production into the factory to develop greater control than was possible with the putting-out system, the platform extrudes the work and obligations outside the boundaries of the firm. Nonetheless, platforms retain control. As Grabher & König (2020) highlight the platform is able to use the terms and conditions that all users must agree to as part of joining the platform to *maintain* control over the complementors. Indeed, as Ghazawneh & Henfridsson (2013) and Eaton et al. (2015) show, an even more powerful form of control is the design of the platform that is "hard-coded" into the software. For example, the original Uber software did not have the option of provide a tip, because Travis Kalancik believed tipping created "friction" and thus it was not possible to tip until 2018 when Uber relented and added a "box" on the smartphone bill allowing a tip (Bhuiyan, 2017). Together, the unilateral contract and the unilateral control of the platform's design result in a remarkably asymmetric relationship between all users and the platform owner (Cutolo & Kenney, 2020).

1.1 Polanyi and Platform Economy Redux

The preponderance of the literature on platforms accepts that they create networks and are based upon the mobilization of ecosystems of complementors (Cusumano et al., 2019; Parker et al., 2016). Grabher & König (2020) appear to accept these metaphors as descriptive of the of the relationships mediated through platforms. In actuality the relationship between the members of the ecosystem and the platform is hierarchical and based upon an extreme power asymmetry within which the ecosystem members are at the mercy of the platform which controls the nexus of relationships (Cutolo & Kenney, 2020). It can dictate the terms and structure of the relationship and, in fact, who can connect with whom. To illustrate, if a website cannot

7. The sources of this "regulatory" power are described in greater detail in Cutolo & Kenney (2020).

be found by Google, in practical terms, can it be said to exist? These are networks in that connections are made between actors, but the connection is through the platform. In this sense, platforms are more like a traditional switched network, or a switchboard, not like the multinodal fabric of the internet as conceived by Paul Baran (1964) in the early 1960s. So, within the internet with its web of interconnections are these platforms, each a central point of contact for a fiefdom.

2 Data as a Fictitious Commodity

The extension of Polanyi's fictitious commodities, land, labor and money by Grabher & König (2020) is an intriguing conceptual question. As they write,

> *[d]ata, then, correspond with Polanyi's (1957, p. 75) construal of "fictitious commodities": they are brought to the market, but are "not produced for sale." Utilizing Google maps or hitting the "like"-button on Facebook, as might be assumed quite safely, are not motivated by the intention to produce data, but rather to get directions and to signal approval respectively.* (Grabher & König, 2020, p. 105)

Clearly, as we and other have argued data can be seen as the raw material that is processed by algorithms (Kenney & Zysman, 2016), whether on a platform or not. Data has unique characteristics in that it can be gathered through a conscious transformation of the analog ("real") data into digital and processable data, however, as Zuboff (1988) showed data is also a by-product of any interaction with digital devices. Being a by-product, does not make something a fictitious commodity. To illustrate, a by-product of wine-making was grape skins and seeds, however someone figured out that these waste materials could be fermented to produce grappa. These by-products neither before or after being commercialized were fictitious — they simply were not recognized as having value. They became commodities. In the digital world, these are sometimes termed "digital exhaust", as they are the traces left as we surf through websites (Huberty, 2015).

If we consider, the three Polanyian fictitious commodities, they have a powerful social actor attached to each of them. Land, of course, had the "landlord"; labor which refers to those that sell their labor time to reproduce themselves; and capital/money, which is rewarded with interest.[8] Data, on the other hand, has no particular social actor associated with it — there are many firms that sell data ranging from FICO scores to stock prices and sports statistics. Data, of course, can be seen as a raw material, but as Gitelman (2013) cautions us is never raw it is always aggregations with classifications. Data comes produced and thus as a product of human labor.

While Grabher & König suggest that data is not produced "for sale" (2020, p. 105), in fact, the key to the platform firm's business models is collecting, organizing, and analyzing data to extract value from it, i.e., to use it to provide a good or service in exchange for money. Is data a fictitious commodity? It is clear that it has different characteristics than a physical good, such as, an automobile. Also, its use is largely through software and is difficult to price as a single item as it is always used with more data. On the other hand, to have value it must be processed

8. As an interesting aside, in the contemporary period the two fictitious commodities — labor and capital — are being capitalized by finance. To illustrate, increasingly the ownership of land is being capitalized into real estate investment trusts, mortgage-backed securities, etc. For a fascinating discussion of this in regards to the rental housing market, see Fields (2019).

and "worked up" by machines created by human beings and ultimately humans must valorize it. At this granular level of analysis, it is uncertain how much greater analytic precision is gained by labeling it a fictitious commodity.

Whether it is valuable to consider data "fictitious" can be understood at another level. Mainly, Polanyi's fictitious commodities, land, labor, and money corresponded to larger socio-political blocks or, in Marx's terms, classes — landlords, workers, and capitalists (money being a store of value). They were also a set of social relationships to the means of production. Does data represent a class or a fundamental new set of social relationships? At first glance, we are prone to dismiss the ownership of data as fundamental. However, the Great Transformation did create another social actor, the modern State, which had many functions, but as Max Weber's work on bureaucracy so powerfully showed the state was a massive collector of data — censuses, tax records, social security, imports and exports. It was the largest repository of data. Today, the data held by governments is dwarfed by the platform firms. This, of course, links back to the observation that the platforms have become regulators in the spheres that they control. Perhaps, this justifies considering data as a new fictitious commodity. If this argument is valid, then, in fact, this may be another great transformation with platform firms as a new category of organizations different from other firms.

3 The Pervasive Impact of Platforms

Today, billions of people get their news, communicate, transact, and recreate through a digital platform or through layers of digital platforms. For example, they use their smartphone to listen to Spotify or buy in the Amazon Marketplace, while searching Yelp for a highly rated restaurant that are pinpointed on Yelp's Google Maps plug-in. While in China, purchasers buy nearly everything through WeChat Pay or Alipay using their smartphone. The platform economy is restructuring all aspects of the contemporary society. As Plantin et al. (2018) observe, the most powerful of these platforms are becoming general societal infrastructure, while the sectoral platforms, such as, Airbnb, Booking.com, Didi, Etsy, Expedia, Match.com, Spotify, TikTok, Uber and others are restructuring their particular market segments.[9]

Of the earlier platform firms only Apple and Microsoft made the transition from the personal computer world to the platform economy. Globally, the other platform firms are less than thirty years old. The leading platform firms, Google and Facebook, have in excess of two billion users for some of their services. The major Chinese platforms have in excess of 750 million users, though they are largely confined to their home market (Jia et al., 2018). As importantly, the larger firms now have developed multiple platforms and services that reinforce and feed each other.[10]

The case of Amazon is instructive, as it began as a website selling products, but in 2000 transitioned to a platform strategy, which it then leveraged to enter into yet other sectors expanding in multiple directions to include: first-party product sales, the Marketplace, logistics and warehousing, cloud services, internationalization/globalization, entertainment, physical stores, and physical devices (Aversa et al., 2020; Kenney et al., 2020a). Amazon used these expansions to become one of the most powerful and valuable firms in the world as it entered and transformed industry after industry. While these expansion paths are most remarked upon in the case of mega-platform firms such as Amazon and Google, sectoral platforms also expand

9. For a similar process in the case of electricity, see Hughes (1993).

10. For a graphical depiction of this expansion for the case of Amazon, see Kenney et al. (2020a).

across traditional sectoral boundaries. For example, Uber began in black limousines, but now has many different types of services, including UberEats, JUMP Electric Bike Share, UberCash, and Uber Health. Similarly, Airbnb, which expanded globally from accommodation to other services such as vacation rentals, and then added multi-family property owners and hosting teams, Experiences, and Neighborhoods.

Platforms critically change the character of markets that the enter. There has been much discussion of how the condition under which the fictitious commodity, labor, is organized and compensated (Bearson et al., 2019; Kenney & Zysman, 2019; Schor & Vallas, 2020). In a recent article, Cutolo & Kenney (2020) suggest that business activity and entrepreneurship is becoming dependent on and vulnerable to exploitation and even expropriation by the platforms intermediating their relationships with consumers. Even in sectors that we do not normally associate with digitization, such as agriculture, not only are being digitized, but a variety of organizations are attempting to platformize and, thereby transform the industry (Kenney et al., 2020b).

The power of platforms toward social actors dependent upon them is profound. To illustrate, platforms can unilaterally change competitive or labor conditions on the platform entirely at their own discretion unilaterally and with no warning. As the panopticon they can monitor or, in the words of Zuboff (2019) surveille activity and shape that activity in ways that are most advantageous to the platform.

In terms of geography, the birthplaces and current headquarters of these firms are remarkably concentrated in the West Coast of the US and China. As we mentioned earlier, their geographic reach particularly through the mobile phone touches the smallest village in the developing world. Moreover, in these locations platforms such as Google and Facebook appear remarkably local providing granular advice and reviews about local retailers and the most intimate local gossip. Google Maps through Streetview provides visual representations of the most local streets to the entire world, while platforms such Upwork open certain types of work to the global labor force (Wood et al., 2019). With the exception of China, up until now borders have been of little importance for the platform firms, as adoption is as easy as a download, as can be seen by the rapid adoption of the Chinese short video app, TikTok, which, for the first time, is a Chinese cultural product that appeals to Western audiences. The pervasive nature and political, economic, and social power of platforms is now being appreciated and only recently being measured (see, for example, Kenney et al., 2020a). Increasing our understanding and measurement of the extent and depth of progress of the platform economy is a task that has only recently gotten underway in earnest.

4 Concluding Thoughts

Polanyi's perspectives, as Grabher & König (2020) suggest, provide useful theoretical optics for understanding the platform economy. We agree with them that the sharing-economy trope, even if it applies to firms such as Uber, Airbnb, and others, is inaccurate. But, importantly, as we suggested in our original writing on the platform economy, Kenney & Zysman (2016) and then even more emphatically in Kenney & Zysman (2019; 2020a) the sharing economy and, for that matter the gig economy, notions miss the impact of the far more transformative mega-platforms. We are also drawn to Grabher and König's ideas about data as another fictitious commodity — it certainly has unique properties as do Polanyi's other three fictitious commodities, but it has no unique social actors associated with it — and it is certainly bought and sold in the market like other commodities. Whether the increasing centrality of data as a

commodity will lead to another great transformation is for the future to decide. What is certain is that the platform economy is a new phase in the market society and that platforms are increasing their penetration.

Polanyi, of course, theorized that there was a double movement. Both Grabher & König (2020) and ourselves have documented the "commodification" movement and the reorganization of society by the platforms. The dialectical response to this could be the reaffirmation of true sharing, which, of course, is possible across platforms whose *raison d'être* is not profit, but rather the meeting of human needs and matching parties for social benefit. The Open Source Software movement was one of the inspirations for Benkler's wealth of networks, Fitzmaurice et al. (2018) based on interviews with "sharing" economy service providers find that, at least, some have goals beyond income, and, finally, Schor (2020) argues the sharing economy was hijacked and can be recovered. The question that Marx faced was whether the utopian socialists could ever transform society and, if so, short of revolution, how could this occur. Trebor Scholz (2016) has argued that cooperatives could provide an alternative to the current privately owned giants. Of course, the double movement that Polanyi observed came out of the crucible of two world wars and a great depression.

The parallels that Grabher & König (2020) draw with Polanyi's (1944) analysis of the "Great Transformation" are a significant contribution to thinking about the meaning and importance of the emergence of an economy in which an increasing proportion of activity is mediated by platforms. Finally, can a global pandemic and threatening serious recession, within which, the platform giants are having their power reinforced and, in truth, becoming more powerful than ever (Kenney & Zysman, 2020b), spark the social energy and political will to allow the double movement of a socio-political response that creates a more humane and inclusive economy?

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Enclosure 4.0: Seizing Data, Selling Predictions, Scaling Platforms

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Abstract

Advance notice: Rather than a straight narrative, this is a roadmap, roughing out rather divergent pathways for the further exploration of platforms. The essay sets off by reiterating the agentic qualities of machinery for understanding the dynamics of platformization and elucidates the dialectical dynamics of (dis)embedded digital platform labor. Subsequently, the societal implications of the "asset-light" business model of platforms as well as of the framing of platform labor as independent entrepreneurship are explored. After perceiving datafication through the optic of assetization, the essay finally explores the platformization of manufacturing and agriculture and the morphing of the material and the digital in the Internet of Things (IoT). A somewhat restless journey, no doubt. But positioning the various pathways vis-à-vis Karl Polanyi's stand should prevent us from losing orientation.

Keywords: Platforms; Internet of Things (IoT); asset-light business model; datafication; Polanyi.

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"Whereof one cannot speak, thereof one must be silent."
— Ludwig Wittgenstein, *Tractatus Logico Philosophicus*, Prop. 7.

"Everything that can be said, can be said in passing."
— Elfriede Gerstl, *Spielräume*

1 From Prophetic Script to Pattern of Thought: Thinking With and Beyond Polanyi

1.1 The Leonard Cohen-Principle

Still controversial, still inspiring: such is the work of Karl Polanyi. While it is easy to find inconsistencies in Polanyi's œuvre, it can also be read, and more constructively, "with an eye to its programmatic purpose, methodological potential, and guiding spirit" (Peck, 2013, p. 1551). "Perhaps", as Gudeman (2001, p. 84) reasoned, "Polanyi did not write with the erudition of Mauss, the grace of Malinowski, or the force of Lévi-Strauss, but he is persuasive for his ideas if not his data." Polanyi's style was expositional, moving "back and forth between metaphor and metatheory", but which nevertheless crystallized around "a series of constant causal arguments" across an impressively broad spectrum of conjunctures (Block & Somers, 1984, p. 71).

Very much in this spirit, our framing of the emerging platform economy through a Polanyian optic (Grabher & König, 2020) was animated by the ambition to appreciate Polanyi's writing as a "pattern of thought" (Polanyi Levitt, 1990, p. 1). We emphatically did *not* seek to side with the strand of Polanyi exegesis that is committed to a hagiographic transfiguration of Polanyi, nor were we interested in joining the quest of identifying *the* authentic Polanyian voice in his rather polyphonic contributions to various (disciplinary) debates. If 75 years of exegesis and a new wave of studies, aimed at the intellectual and historical contextualization of his work (see, for example, Buğra & Ağartan, 2007; Brie & Thomasberger, 2018; Dale et al., 2019) arrived at a widely-shared conclusion, it is this: it remains presumably impossible, but certainly unnecessary, to agree on a single legitimate reading of Polanyi (Luban, 2017, p. 76).

For one, even Polanyi's canonical concepts — embeddedness, fictitious commodification, double movement — prove surprisingly elusive upon closer inspection (see, for example, Cangiani, 2011, pp. 190–194; Dale, 2011a; Deutschmann, 2019, pp. 35–59). The emblematic ambiguity of Polanyi's writing might be attributed to the "volatility of his intellectual journey" and his "enthusiasms for the most diverse thinkers" (Dale, 2011b, pp. 160–161). More importantly, however, it seems exactly Polanyi's ambiguity that has made his thought so fertile: "There's a crack in everything, that's how the light gets in", as humanistic scholarship asserts (Leonard Cohen). The project of thinking with and beyond Polanyi derives its progress and passion not from some easy, yet stabilized consensus, but from ongoing negotiations between conflicting attributions and interpretations: "coordination through misunderstandings" in a truly heterarchic search (Stark, 2009, pp. 190–195).

For another, beyond questions of interpretation, critique of Polanyi's work itself has become an integral strand within contemporary Polanyian thought (Holmes, 2019, p. 2). Whereas the defensive endeavor to protect the true heritage of Polanyi from any contemporary contamination confines itself to a pedantic dissection of ever more nuances in Polanyi's writing, it is the scholarship that deliberately suspends the imperative of unconditional faithfulness to the original that offers most compelling perspectives on contemporary issues.

In fact, deliberate dissociations from the original writing that do not flinch from reasoning explicitly *contra* Polanyi, have produced most powerful advancements of the canonical notions of double movement (Fraser, 2017a; 2017b) and embeddedness (Deutschmann, 2019, pp. 18–29) as well as of Polanyi's controversial reading of English economic history (Block & Somers, 2014). These achievements (prefaced with the ceremonial reassurance of a *sympathetic* appreciation of Polanyi's reasoning) seem to converge towards a post-Polanyian approach of inquiry that is: (1) *relational* (positioning specific configurations within a wider context of coexisting and conflicting modes of exchange and regulation), (2) *processual* (exploring ongoing processes of marketization) and (3) *institutional* (foregrounding the regularized dimensions of marketization) (Peck, 2020, pp. 67–68).

Motivated by the intention to advance such a post-Polanyian perspective, the key arguments of the current essay are developed along three angles towards Polanyi's writing. By reasoning *with* Polanyi, the subsequent section reiterates the agentic qualities of machinery for understanding the dynamics of platformization. After briefly departing from Polanyi's problematic conception of the social, the essay subsequently verges back to Polanyi by elucidating the analytical power of the notion of embeddedness to conceptualize digital platform labor. Reversing direction again, the argumentation moves *contra* Polanyi: the supposed absence of the double movement is attributed to the asset-aversion of platform orchestrators and the framing of platform labor as independent entrepreneurship; and rather than perceiving data as an object of fictitious commodification, they are apprehended through the optic of assetization. Finally, by pushing *beyond* Polanyian terrain altogether, the essay explores the platformization of manufacturing and agriculture and the morphing of the material and the digital in the Internet of Things (IoT). A turbulent journey indeed. But, hopefully, the serpentine path will yield some unexpected vistas.

1.2 Liaisons Dangereuses? The Delicate Proximity to Kondratiev and Technological Determinism

These reflections on the generative ambiguity of Polanyi's thought and the explanatory power of a post-Polanyian perspective, however, should not be read as lengthy justification for a retreat from the Polanyian positions we advanced in the original essay (Grabher & König, 2020). The current essay is not a confession, nor do we seek absolution. Rather than remorsefully offering some sort of pacifying compromise, we stand our ground, particularly with regard to the catalyzing role of technology.

First, Pais and Provasi (2020, pp. 1–2) seem to insinuate that our discussion of the machinery of the Industrial Age boils down to a mono-causal, technologically-deterministic understanding of long-term economic transformations. We are closer to Kondratiev than to Polanyi, is the verdict. However, our framework is emphatically a multi-dimensional approach that seeks to elucidate the interdependencies between technological affordances, performative effects of science and the reconfiguration of regulatory institutions. As such it rather resonates with the multiplexity that permeates the development and industrialization theories of Wallerstein (1979), Gerschenkron (1962) or Landes (1970) than with Kondratiev's narrow technological determinism. Regardless where the closest resemblance amongst these theories eventually is located, the affinity to related theories does *not* disqualify our approach as non-Polanyian. On the contrary, we seek to honor Polanyi's embracive perspective that is perhaps more aptly expressed in the *plural* of the working title "*Origins of the Cataclysm*" than in the singular of the final label "*The Great Transformation*".

Second, we in fact regard it as a particular contribution of our proposal to re-introduce the role of technology into a debate that more recently has mainly revolved around institutional and political dimensions of a double movement (and an apparent absence thereof) and around rather mechanistic perceptions of an oscillation between more and less embeddedness. For all the ambiguity (generative or not) of his writing, Polanyi is exceptionally plain when it comes to the transformative role of machinery (Polanyi, 1944/2001; pp. 12, 44, 75–76, 92, 98). He widens the perspective from the preoccupation with the introduction of a novel apparatus (that can analytically be isolated as "technical progress") to the economic prerequisites and societal ramifications of the new production regime: the sweeping commodification of inputs, and of labor in particular (Markantonatou & Dale, 2019, p. 58). Polanyi (1944/2001, p. 92) leaves little room for any misgivings when he invokes the steam engine that "was clamouring for freedom and the machines [that] were crying out for human hands".

Whereas contemporary social science habitually foregrounds the plasticity of technology as "affordance" (Gaver, 1991), Polanyi stresses the institutional conditioning of technology (at times, in fact, with an ostentatious argumentation that verges on determinism). Just as any conceptualization of the breakthrough of industrial capitalism that does not account for the momentous impacts of machinery remains partial, the emergence of the platform economy cannot be conceived without incorporating the agentic qualities of server facilities, cable grids, satellites, chips, routers or smartphones (the "D" for devices in Caliskan's (2020) imaginative DRAN-proposal).[1]

2 From Performativity to Performances: What about People in Transformations (Great and Small)?

2.1 Beyond Polanyi's Dualist Grammar: The Variety of Societal Counter-Movements

The role we ascribe to technology in our Polanyian framing of platforms (Grabher & König, 2020) has also motivated Lee and Watkins (2020) to voice critical concerns and, in fact, to propose an extension of our perspective onto a most consequential interrelation: people and platforms. Inspired by interactionist and social constructivist understandings, Lee and Watkins (2020, p. 3) suggest to center on "how people creatively interact with and work alongside the nonhuman actants that populate and shape pour worlds". Their intention, phrased differently, is to shift attention from technological *performativity* to people's *performance* of technologies. Lee and Watkins (2020) indeed identify a crucial void in our framework that, despite all its alleged Polanyian ethos of multiplexity, is categorically silent on something more than a detail: people. And our omission is not even of the flattering type of a deliberate decision against a particular explanatory variable, but rather of the kind of distorted vision. But, of course, Polanyi is ultimately to blame for this.

Polanyi's perception of the non-economic (to which "people" obviously belong to), once more, has been object of persistent critique (see, for example, Hodgson, 2016). The interrelation between the economic and the non-economic is reduced to the simple binary formula of economy *vs.* society, of planned effort (to extend the reach of markets) *vs.* spontaneous

1. The scholarship in the Actor-Network (ANT) tradition, Caliskan (2021) maintains, evolved into a research program that added two particular analytical angles to the original proposal, (D) Devices and (R) Representations, and hence extended the ANT- towards a DRAN-approach.

response (determined to repel this incursion) — ultimately of: bad *vs.* good.[2] Nancy Fraser (2017a; 2017b) has launched the presumably most trenchant critique of this binary that neglects the emancipatory dimensions of markets (that not only brought "dark satanic mills" but also freedom), and jams everything non-economic into the black box "society". By conflating the distinctions between state and civil society; private and public spheres; and nations and local communities, this binary obscures the social structure of society. Moreover, the normative resonances of the economy *vs.* society dichotomy suggest a "cold, dangerous, and volatile economy undermining a warm, safe and stable society" (Fraser, 2017b, p. 7). But, as Fraser insists, "society" is hardly unequivocally virtuous, and Polanyi's reification of society "encourages us to overlook its nasty aspects, including sexism, racism, homophobia, and exclusionary provincialism. Nor is stability an unmitigated good" (2017b, p. 7).

Fraser also most compellingly exemplifies how a rigorous critique of Polanyi's reasoning yields more powerful insights than devoted attempts to salvage Polanyi from his own flaws (see, for example, Prudham, 2020). Rather than lamenting on what is absent (a double movement), she inquires that which is present: emancipatory movements such as feminists, anti-racists or anti-colonialists who cannot be projected onto either side of Polanyi's binary theorem as they fight against the repressive impacts of both, markets *and* society. Championing neither marketization nor protection against it, they espouse a third agenda of *emancipation* (Fraser, 2017a, pp. 36–38).

2.2 And Back to Polanyi: The Dialectics of (Dis)Embeddedness of Digital Labor

Once more, however, incisive critique does not invalidate a Polanyian perspective in general. In the spirit of a critical reconstruction, Polanyi's reasoning proves instructive in conceptualizing people's performances of technology "in the wild" that Lee and Watkins (2020) set their sight on. Viewed through Dale's (2010) analytical lens that reveals a "soft" and a "hard" Polanyi, the notion of embeddedness affords an instructive approach to conceive, for example, the performance of platforms that arbitrate digital labor. In their extensive study of remote digital gig work, ranging from data entry over translation to software programming, in Southeast Asia and Sub-Saharan Africa, Wood et al. (2019) examine how platforms such as Upwork and Amazon Mechanical Turk induce a dialectical dynamic of dis-embedding and re-embedding labor.

The hard-Polanyi perspective of embeddedness is firmly anchored in the fundamental critique of marketization and unravels the efforts necessary to break labor free from "the rest of life" (Polanyi, 1944/2001, p. 76). In order to transform work into "mere chunks of raw material" (Polanyi, 1977, p. 9), it has to be freed from established cultural norms and legal regulations that interfere with the further expansion of the market logic into society (see also Thompson, 1963). This process of institutional dis-embedding is a prerequisite for construing platform labor as a resource that can be purchased and dispensed with unimpeded and frictionless "on-demand" (Wood et al., 2019, p. 942). To reap the benefits of the "asset-light" business model (Parker et al., 2016, pp. 68–70), platform orchestrators vigorously defend (through countless litigation cases across a multitude of jurisdictions) the key premise on which their self-conception as neutral intermediaries is built: gig-workers are independent "contractors" who, categorically, do not qualify as "employees" (with corresponding legal entitlements) (Grabher & van Tuijl, 2020, pp. 1010–1011).

2. The dualist grammar in Polanyi's reasoning resonates with Ferdinand Tönnies' well-known couplet, *Gemeinschaft* (community) and *Gesellschaft* (society) that exerted significant influence on Polanyi's "confection of ideas" (Dale, 2011a, pp. 309–310).

The soft-Polanyi perception of embeddedness, championed by the new economic sociology built around the paramount contributions of Mark Granovetter (1985), scales down the focus from societal institutions to the analytical level of concrete personal relations and networks (Dale, 2011a, pp. 325–329). The confrontation of hard and soft readings reveals the dialectics of (dis)embeddedness of remote platform labor. At the same time as *normative disembeddeness* exposes the digital gig workers in Southeast Asia and Sub-Saharan Africa to the vagaries of unregulated labor markets, these workers forge *network embeddedness* to cope with these very market volatilities (Wood et al., 2019). Through network embeddedness, gig workers create relational resources that help them to negotiate the low-trust nature and isolation of remote digital labor and that offer mutual practical and emotional support: collective practices that Lee and Watkins (2020, pp. 3–4) aptly label as "articulation" and "opposition". This imaginative reading by Wood et al. (2019, p. 946) demonstrates that *network embeddedness* is instructive for understanding *how* work gets done, whereas normative embeddedness is useful for apprehending the *conditions under which* the work is done.

3 From Double to Supporting Movement: Economic Benefits of Platforms (Whereof One Rather Should not Speak)

3.1 Can Platforms do Good? Leveraging Opportunities

The taxonomy of "performances in the wild" proposed by Lee and Watkins (2020) reveals a variety of resourceful practices through which people deploy, appropriate or work around platform technologies. The classification of practices into the categories "innovation", "articulation" and "opposition", however, seems to be biased towards (varying degrees of) flouting platform technologies. Even "innovation" seems to presuppose some degree of transgression *contra* the prescribed mode of using technologies. But what about an employment of platform technologies for individual benefit that is not just deliberately in line with the overall intentions of the platform orchestrator, but also in compliance with every pedantic detail of the Terms-of-Service?

The point here is not to find fault in a taxonomy, but to highlight that compliant performance practices that might be labelled "leverage" offer tangible economic benefits by topping up household income. The roughly 2,9 million hosts on Airbnb earn a monthly income of $924 on average (Goldschein, 2020) (as of September 9, 2020). On Upwork, 3 million jobs worth roughly $1bn are posted annually; and the income generated by digital labor platforms is estimated to reach $505mn per year worldwide, though distributed extremely uneven across socio-demographics and global geographies (see, for example, Wahome & Graham, 2020).

Adding to these *supply*-side benefits (for the Airbnb host and Uber driver), the real and perceived *demand*-side advantages (for the Airbnb guest and the Uber passenger), brings us also closer to answers of the question of the apparently missing double-movement against the further assault of (normative) dis-embeddedness of labor launched by platforms. Although our Polanyian framing of the platform economy (Grabher & König, 2020) was explicitly *not* concerned with this apparent puzzle posed by Pais and Provasi (2020, p. 3), advancing tentative answers to this question appears promising since they foreground the unfolding *processual* dynamics of platform*ization* that Caliskan (2020, pp. 5–6) compellingly advocates for in his critique.

Yet again, Fraser (2017a, pp. 33–34) offers a most cogent analysis of the only *half*-Polanyian character of the contemporary political constellations: while the structural logic

of intensified commodification seems intact, the expectation of a double movement has been frustrated. The linchpin of her reasoning is the fundamental transformation from a capitalism based on industrial production to one in which "capital prefers, when possible, to bypass the risky business of production" (Fraser, 2017a, p. 33). In the industrial era workers possessed considerable clout since spatial concentration facilitated organization that generated a tenacious constituency and political base for the protective pole of a double movement.

In the current conjecture, however, platform orchestrators effectuate this preference "to bypass production" in a most resolute fashion by capitalizing on the promises of the "asset-light" business model. In fact, the (market) valuation of platform orchestrators does not reflect their control of (physical) assets but, quite diametrically opposed, their capacity to evade accountability for assets and the responsibilities implicated with ownership (Grabher & van Tuijl, 2020, pp. 1008–1009). Although we are presumably multiple "great transformations" away from a "capitalism without capital" (Haskel & Westlake, 2017), platformization further shifts the standard registers of economic accounting (and valuation) from the tangible (like factories and machinery) to the intangible (like knowledge and branding) (Mauboussin & Callahan, 2020, pp. 3–4).

3.2 Beyond Class Distinctions? The Revolving Identities of Platform Users

Of no less importance for understanding the missing second half in Polanyi's structural logic is the fact that "the class division between labor and capital ceases to appear self-evident" (Fraser, 2017a, p. 33). The erosion of this previously crisp boundary gains particular momentum with the framing of gig work in terms of autonomy, flexibility and low-entry requirements. By accentuating these favorable aspects of freelancing, gig work is reattributed as free enterprise. And in fact, at least for the segment of part-time gig workers, this framing corresponds with the subjective experience and self-conception as entrepreneurs (Berger et al., 2020) that, at the same time, of course, also involves hardly mitigated exposure to existential risks and unpredictable demand (Peticca-Harris et al., 2020). At this point, Polanyi's (1957, pp. 116–117) passionate rejection of the idea that rent-seeking behavior is inextricably woven into human *nature* as an innate "propensity to truck, barter and exchange" appears inch-perfect. Rather, platform orchestrators afford the institutional and ideological *context* that compel actors to pursue their self-interest by monetizing "underutilized" individual and domestic assets (see also, Grabher & König, 2017).

The Airbnb Citizen Initiative is paradigmatic here: it seeks to transform the disperse collective of platform hosts into a global community, even a social movement, of middle-class entrepreneurs who seek to supplement their income in a climate of economic insecurity and technology-enabled opportunity: "Our people-for-people platform allows ordinary people to use their house — typically their greatest expense — to generate supplemental income to pay for costs like food, rent, and education for children" (Airbnb Citizen, 2017). Positioning itself as a beacon of entrepreneurial opportunity, Airbnb has effectively scaled and legitimized the transformation of the most intimate personal space of the home into a business asset. Airbnb, then, provides the operating system for reworking the relation between "people", market and the state on the municipal level, by "normalizing and intensifying household practices of financial calculation, competition, and (micro-)enterprise" (van Doorn, 2020, p. 1819).

The self-evidence of traditional class distinctions is further obscured by a central feature of two-sided market places with low entry-barriers (such as Airbnb, Uber or Upwork): switching from the side of entrepreneurial producer to the side of gratified consumer (and back in

the subsequent transaction) is not only a near-frictionless real opportunity, but also a practice embraced by platform users to enhance credibility and trustworthiness among strangers: every respectable Airbnb host boasts of the extensive travel record — acquired as Airbnb guest, of course. The experience of tangible economic benefits as entrepreneur or as consumer or, emblematically, as both, as well as the framing exercises of platform orchestrators also provide clues for understanding the virtual absence of a potent double movement.

Although November 3rd, 2020 might be remembered for different reasons (as the day of the US presidential elections), it was also the day on which the pivotal premise of the "asset-light" business model of platforms was at stake. In California, a key arena for legal disputes over the status of gig workers in the platform economy, 58% of voters opted for Proposition 22. This ballot measure, sponsored by Uber, Lyft and the delivery platform DoorDash with a $200mn campaign, allows platform orchestrators to continue to treat gig workers as "independent contractors" (*The New York Times*, 2020a). "Society", put bluntly, opted for "commodification" and against a protective "double movement". The weight of this verdict (which does not even apply on a national scale) for the viability of the "asset-light" business model can be read off from the $20bn boost of market capitalization for Uber and Lyft in the subsequent week (*The New York Times*, 2020b).

4 From Commodity to Asset: Data = Oil?

4.1 Looking Back: Two Karls, two Polanyis, and the Quandary of Commodification

As much as the machines of the Industrial Age ushered in the commodification of labor, the new digital infrastructures of platforms, as we argued previously (Grabher & König, 2020, pp. 105–106), precipitate the commodification of data. While Kenney, Zysman and Bearson (2020, p. 18) are to some extent drawn to this analogy, they also voice substantial concerns about this categorization of data, since "it is uncertain how much greater analytic precision is gained by labelling it a fictitious commodity" (p. 14). By positioning themselves closer to Marx than to Polanyi, they bring an omission in our Polanyian perspective to the fore. While both Karl's anatomize the capitalist logic of all-embracive commodification (through the corresponding notions of commodity *fetish* and commodity *fiction* respectively), Marx affirms that commodities are not "things" with an inherent value (see also Özel, 2019, p. 138). Rather, value has to be extracted and appropriated through historically specific social relations. Is this analytical juncture the point where we should leave Polanyi behind (again) in order to more adequately categorize data — by moving either back to Marx or rather forward to contemporary accounts?

As regards a glance backwards, it seems not without irony that Marx (writing roughly a century earlier), particularly in the *Grundrisse*, appears more amenable to an understanding of the role of knowledge[3] in the present knowledge economy than Polanyi. With his discussion of the "general intellect", Marx adumbrated a conception of knowledge as a generic factor

3. If more than two decades of debating the knowledge economy has drummed one thing into us, it is this: data and knowledge are not the same. In fact, they occupy very different positions in the data-information-knowledge-understanding-wisdom hierarchy that dates back to Ackoff (1989). In the current context, though, we gloss over the fundamental differences and focus on the economic features they both share as a specific kind of a "troublesome commodity" (Gandy, 2011, p. 436).

of production that cannot be fully appropriated privately (Marx, 1857/1974, p. 206).[4] Perhaps even more ironically, Karl Polanyi's younger brother Michael continues to exert a more sustained influence on debates on knowledge, in particular through his conceptualization of "tacit knowledge" (Polanyi, 1966) that is geographically "sticky" and neither can be fully codified nor be circulated without friction (Tödtling, 2020; see also Gertler, 2003).

Nevertheless, of course, (Karl) Polanyi's theorizing on commodification has provided inspiration for theorizing knowledge-based capitalism. Most prominently perhaps, Michael Burawoy (2010, p. 310) has pondered the question if knowledge represents the "fourth fictitious commodity" and, rather than proposing an unequivocal verdict, advanced instructive differentiations. True, analogous to the fencing off of common land, common knowledge can be partitioned and turned into intellectual property (Cangiani, 2020). As subject of commodification, knowledge is disembedded from its societal contexts so that the primary register of governing the advancement and use of knowledge "becomes profitable/unprofitable rather than true/false, sacred/profane, healthy/diseased" (Jessop, 2007, p. 120). Also true, similar to the double movement against the commodification of labor, the enclosure of common knowledge into intellectual property is provoking resistance (Burawoy, 2014) as, for example, the EU General Data Protection Regulation (GDPR) as well as the staunch defense of open-source initiatives (Reitz, 2019, pp. 200–201) indicate. Interim conclusions: Commodification of knowledge? Yes. But transformation of knowledge into a fictitious commodity? Not sure.

In seeking answers to the latter question, Burawoy (2010, p. 310) accentuates a feature of fictitious commodities that our simple formula (data = fictitious commodity) did not take into adequate consideration. For Polanyi, a fictitious commodity has the form of a commodity (can be bought and sold), but actually was not produced in order to be sold. And crucially (and therein lies our inattentiveness), the commodity fiction disregards "the fact that leaving the fate of soil and people to the market would be tantamount to annihilating them" (Polanyi, 1944/2001, p. 137). Although labor, land and money are essential in a market economy, Polanyi (1944/2001, p. 73) warns that "no society could stand the effects of such a system of crude fictions [...] unless its human and natural substance was protected against the ravages of this satanic mill". Knowledge and data, however are not afflicted with this self-destructive dimension of fictitious commodities since they represent a particular class of "troublesome commodities" (Gandy, 2011, p. 436): They obviously are not *scarce* resources and their utilization is *non-rivalrous* (utilization by one actor does not preclude utilization by another), while the marginal costs of reproducing data is essentially zero (Romer, 1990).

4.2 Looking Ahead: From Commodification to Assetization

The glance back, to *both Karls* and to *both Polanyis*, then, yields insights that obviously are only partially instructive for conceiving the nature of data in a contemporary context. Looking beyond the writings of these three titans (that unavoidably also reflect the industrial capitalism at the time of their genesis) reveals a perspective that promises to perceive current capitalist development in a more incisive fashion: *assetization* (Birch & Muniesa, 2020). Whereas (Polanyian) commodities are bought and sold on markets according to a market price that signals *present* supply and demand (very much as neoclassical marginal utility theory would suggest), the value

4. "The development of fixed capital", as Marx (1857/1974, p. 206) proclaims, "indicates to what degree general social knowledge has become a direct force of production, and to what degree, hence, the conditions of the process of social life itself have come under the control of the general intellect and been transformed in accordance with it."

of assets resides in its capacity to generate revenues in the *future* (see also Langley, 2020, p. 3). The value of a commodity is signaled by its price at the specific point of exchange, the value of an asset in principle is dynamic and can be assessed through discount techniques (such as Discounted Cash Flow (DCF) or Net Present Value (NPV)) that calculate future earning power (Doganova, 2018). More generally, the concept of assetization emphasizes the socially transformative character of the phenomenon of turning things into assets (Birch & Muniesa, 2020, p. 4).

The transformation of data into a "new asset class" (Zuboff, 2019) is vividly expressed in the industry refrain that portrays data as the "new oil" that has to be "refined" by specialized corporations (Couldry & Mejias, 2018, p. 340). Although Kenney, Zysman and Bearson (2020, p. 13) are on solid ground with their assertion that data "has no particular *social actor* associated with it" (emphasis added), datafication has engendered at least a dedicated *industry* of data brokers. Despite the size of this business, currently estimated at $1.4trn (*The Economist*, 2020a), this industry dexterously operates in the shadow of regulatory oversight and public awareness (Crain, 2018, pp. 88–89) — or have you ever heard brand names such as Acxiom, Experian or Equifax, key players in this industry? Omnipresent, yet hardly visible, these companies are part of the "Big Other", the corporate infrastructures of "reality mining" (Zuboff, 2019).

Today's major data brokers evolved from small companies initially specialized in processing data into client-specific products, such as credit scores (Experian, Equifax), political marketing (Acxiom) or loyalty programs (Alliance Data). By aggregating diverse bodies of data, these companies leveraged "data network effects" (Gregory et al., 2020) that galvanized multiple rounds of consolidation culminating in the current major brokers with their extensive portfolios (Bouk, 2017). Phrased in the trade jargon, the cloud-based Acxiom Audience Operating System (AOS), for example, enables "marketers to connect all types of traditionally disconnected data and — for the first time — to create a truly singular view of the consumer" (Acxiom Corporation, 2013).

These major data brokers are not in the business of trading (personal) data as a commodity that, as a generic resource, provides an input for a multitude of production processes. Data in this line of business rather represent an asset that has to be repurposed and refined to match the needs of specific client firms in the ever extending marketing space (see also Turow, 2012; Birch et al., 2020). The asset (so-called first-party data) derived from purchase history, browsing data, responsiveness to marketing, and location data is then transformed into diverse products (so-called third-party data) (Beauvisage & Mellet, 2020, p. 88). Exemplary products are audience segments describing lifestyles and consumption patterns (such as the Personicx sociodemographic segmentation of Acxiom), enrichment of existing databases (by adding variables to the customer's CRM data base) or risk calculation (scoring and profiling based on purchase history particularly for the banking and insurance sectors) (Beauvisage & Mellet, 2020, p. 85). The assetization of data, then, unfolds in a combination of capturing and repurposing data into "prediction products" that open up multiple streams of future income on "behavioral future markets" (Zuboff, 2019, p. 8).

By reversing the perspective from subject to object, Zuboff (2019, pp. 233–234) elucidates that this extraction of products from assets is inextricably interwoven with the transformation of human beings into bundles of behavioral traits that are tracked, measured and indexed. This transformation amounts to nothing less than the "dispossession of human experience" through "rendition" which comprises the "concrete operational practices through which dispossession is accomplished, as human experience is claimed as raw material for datafication and all that follows, from manufacturing to sales". These "renditions" resonate with Caliskan's (2020, p. 9)

"representations" (the "R" in his proposed DRAN-framework) that "not only represent, but also contribute to the making of realities". And while these practices in managerial accounts are eulogized as enhancements of user value by offering "individualized experience" (Gregory, 2020, p. 4), Zuboff (2019, p. 241) makes plainly clear that these practices are "typically unauthorized, unilateral, gluttonous, secret, and brazen" (see also Langlois & Elmer, 2019).

5 From Thing to Process: Trajectories of Platformization

5.1 Platform Architectures: Fragile Stacks or Robust Hierarchies?

The conspicuous accentuation of the strategies and practices of asset*ization* (in this paper), however, cannot disguise the contorted perspective that Caliskan (2020, p. 5) identified (in our previous essay): we all too frequently lapse into an objectification of the platform economy as a self-contained and already consolidated system of economic interactions. The optic of platform*ization* brings those conflictual processes into sharper focus through which platforms seek to establish themselves as "obligatory passage points" (Callon, 1986) into ever expanding domains of production and transaction. Moreover, an *ization*-perspective seems definitely more in line with Polanyi as the "theorist of discontinuity" (Block & Somers, 2017, p. 380). By envisioning platformization as an open and dynamic process propelled by actors, representations and devices, it pertains to "the interpenetration of digital infrastructures, economic processes, and governmental frameworks of platforms in different economic sectors and spheres of life" (Poell et al., 2019, p. 6).

While Caliskan's critical comment on our tendency of objectifying the platform economy is very well taken, his proposal to construe the mutually enabling economic practices of platforms as "stack economization" (Caliskan, 2020, p. 6), however, does not really appear fully apposite. The layered architectures of platforms, no doubt, are imaginatively visualized as a collection of "stacks" (Bratton, 2016): server facilities and cable grids, cloud computing and big data analytics, smart phones and mobile apps, reputation scores and rating systems, all add up to a complex socio-technical apparatus (Andersson Schwarz, 2017). And yet, by conceiving platform-based economic practices in terms of layered architectures, the trope of stacks tends to conceal three critical aspects.

This construal, first, insinuates that single layers can unproblematically be separated from the larger socio-technical infrastructures through which they operate. Platformization, however, defies the distinctiveness and crisp conceptual boundaries of key notions from which this process unfolds (such as firms, markets, producers, consumers) and through which novel modalities of "managerial governmentality" between state and economy emerge (Grabher & König, 2020, pp. 108–109). Second, rather than an a random aggregation of equivalent stacks, the layered architectures of platforms are fabricated according to strict hierarchical designs. Extreme power asymmetries (Cutolo & Kenney, 2020), to which Caliskan's (2020) Foucauldian reasoning also alludes to, in fact, catalyze subsequent phases of platformization. And finally, the image of stacks conveys a sense of stasis and, at least for its more complex manifestations, of perturbability (a single tap, as we know from the irrefutable laws of nursery physics, causes the stack to collapse). Platformization, however, is evidently about potent processes that, if only temporarily, amalgamate into robust hierarchical constellations solidified through "winner-takes-all" dynamics (Parker et al., 2016).

5.2 Platform Trajectories: Geographies of Encroachment

While the trope of the "stacks", then, affords a somewhat distorted view on platforms (Donavan, 2019), the platformization perspective yields insights into the expansive strategies and practices of platform orchestrators to control access to an ever expanding spectrum of economic and societal domains (Grabher & van Tuijl, 2020, pp. 1008–1009). These strategies, obviously resilient to pandemics and politics, have further affirmed the economic position of the major US-players, Alphabet, Amazon, Apple, Facebook and Microsoft[5] who leverage three powerful dynamics (van Dijck, 2020, pp. 8–10).

First, by expanding *vertically*, platform orchestrators aim at converting the digital infrastructures into service models through the integration of hardware configurations, cloud architectures and data analytics: the "platformization of infrastructure" (Plantin et al., 2018). Integrated into Apple Pay, for example, is a dedicated built-in NFC chip in Apple smartphones that rival pay systems cannot deploy (Shao, 2020). (Hardware) devices and (software) representations are platformized to consolidate the platform business group's position: "platforms rise when infrastructures splinter" (Plantin et al., 2018, p. 300). What is praised as "seamless integration" for the sake of "user convenience", at the same time, causes severe inconvenience due "user lock-in" through the funneling and appropriation of data flows (Van Alstyne et al., 2016).

Second, by moving *horizontally*, platform orchestrators morph into infrastructures for users by establishing themselves as vital obligatory passage points: the "infrastructuralization of platforms" (Plantin et al., 2018). The more contents can be channeled through these obligatory passage points, the more data can be mined, combined and repurposed in order to strengthen the position in the ecosystem. Those who control this obligatory passage points, constitute the core of the entire ecosystem: the self-organized, self-governed and highly exclusive (literally) handful of key players (van Dijck, 2020, p. 9). You need access to a large network? Facebook. You seek access to customers? Amazon. You search (for whatever)? Google. The key players, however, are not just exclusive (on the demand side), but also interdependent (on the supply side). Apple's iCloud, for example, runs on AWS (Amazon Web Services) and Microsoft's Azure, and Facebook is dependent on access to the app stores of Apple and Google. Rather than confining rivalries to the temperate modalities of "coopetition", these interdependencies, however, are also arenas of fierce attacks, as Apple's recent foray into Google's core domain of the search business indicates (*The Financial Times*, 2020b).

Third, platformization becomes even more pervasive as orchestrators expand their influence *cross-sectoral*. The sweeping expansion across sectoral boundaries is driven, predictably, by motives of data capture and, more specifically, by the prospects to collect and combine personal data and behavioral patterns from a multitude of diverse yet related sectors (see also, Beauvisage & Mellet, 2020). Amazon, spearheading platformization across sectors, has more recently entrenched itself in the pharmaceutical, insurance and, most conspicuously, the logistics sector[6]

5. The combined sales of Alphabet, Amazon, Apple and Facebook leapt 18 per cent year on year in the third quarter of 2020, to $227bn, while after-tax profits jumped by 31 per cent, to $39bn (*The Financial Times*, 2020a).

6. While traditional logistics is driven by demand-pull in which the customer's order triggers the sequence from packaging to delivering, Amazon has shifted to supply-push logistics based on predictive analytics (Butollo, 2020, p. 12). The ever shrinking lead times entail a fundamental departure from the platform mantra of the "asset-light" business model: Amazon owns physical assets valued at $104bn which is not far from the $119bn of physical assets of its old-economy rival Walmart (*The Economist*, 2020b). The 7 air hubs, 53 Amazon Now Hubs, 47 Sortation Centers, 187 Fulfillment Centers and 250 Delivery Stations of Amazon in the United

(see also Caliskan, 2020; Kenney & Zysman, 2020). In 2018, Amazon launched a software platform for extracting information from medical files (Amazon Comprehend Medical), acquired PillPack, a major US online pharmacy (Shaya & Eddington, 2020), and launched a healthcare insurance unit (Haven) for its 1.2 million employees. Through cross-sectorization, Amazon (theoretically) could offer a one-stop shop for diagnostics, ordering and delivering of medication, and already (practically) controls the relevant data streams (van Dijck, 2020, p. 9).[7]

Through vertical and horizontal integration as well as cross-sectorization, the major orchestrators attain a highly precarious balance "by carving out spaces for their own platform functionalities, while opening up to rivals in other areas; by coordinating online space with other major players while competing in other segments, and by integrating their own platforms vertically while maintaining competition in 'oligopolistic' platform markets" (van Dijck, 2020, p. 10; see also Dolata & Schrape, 2018).

6 From Digital to Material: Novel Hybridities in Industrial Platforms

6.1 Limits to the Winner-Takes-All Logic: Materiality and Domain Knowledge

The vertical and lateral moves of cross-sectorization not only amount to an intrusion into ever more digital domains, but crucially also imply a shift from *transaction* to *production*, from *service* to *manufacturing* (Caliskan, 2020, p. 6). Polanyian perspectives, as social science expositions of platformization more generally, so far, have centered on the empirical realities of business-to-consumer and peer-to-peer transactions (see also Grabher & van Tuijl, 2020, p. 1006; Menon et al., 2020, p. 364). Exemplary accounts confront questions of commodification of labor (Cangiani, 2020, p. 180) and knowledge (Reitz, 2019), double movements (Pais & Provasi, 2020; Wood et al., 2019) or market regulation (Block, 2020, p. 91); others seek to salvage notions of a "sharing economy" by panning the spotlight onto phenomena that are theoretically interesting, societally noble, but empirically increasingly marginal, like timebanks, for example (see, for example, Arcidiacono, 2018). The attempts to corroborate sharing as a distinct — and viable — mode of integration resonates with Polanyi's (1957) emphasis on the variety of moral principles and institutional rationalities of distribution; the epistemological privilege of institutional aspects at the expense of socio-technical dimensions of platforms, however, appears somewhat *non*-Polanyian — given the holistic ethos of his agenda.

Recalibrating the optics onto the business-to-business realm of industrial platforms, of course, is not merely a matter of empirical relevance or unbiased research focus. Rather, the materiality of production and products on *industrial* platforms conditions specific trajectories that systematically differ from the platformization in the realm of *consumer* transactions (Sturgeon, 2019, pp. 14–16; Menon et al., 2020). Consumer platforms (like Airbnb and Uber) can be scaled rapidly on a global scale by leveraging network effects on a massive scale and by benefitting from (close-to) zero marginal costs (Constantinides et al., 2018, pp. 389–390). The offerings of industrial platforms (like Volkswagen's RIO or MyJohnDeere, for example), in contrast, are inextricably tied to materiality of the products (the truck or the combine harvester)

States alone account for a total footprint of 15.9 km² (Rodrigue, 2020; see also Kenney & Zysman, 2020, pp. 63–69).

7. Amazon is truly "prime" when it comes to converting data streams into income streams: expanding the portfolio of offerings from "Software as-a-Service" (SaaS) (with AWS) into ever more domains such as "Supply Chain Management as-a-Service" (with FBA) is the strategy, and "Everything as-a-Service" (EaaS) is the ultimate goal (Sturgeon, 2019, pp. 6–7).

and, hence, can only be scaled within the confines of the specific industry (Sturgeon, 2019, pp. 14–15). Whereas the proliferation of consumer platforms is driven by winner-takes-all dynamics, the development of industrial platforms is limited by the fragmentation of product markets and industry-specific knowledge domains (Sturgeon, 2019, pp. 14–15).

The industry-specific corridors of industrial platformization, of course, also shape the far-reaching reconfigurations of the material and the digital. Whereas the materiality of products and processes of the past was reduced to the isolation of "dumb" stand-alone devices, the novel generation of "smart" devices features digital capabilities of sensing, storing, analyzing and actuating data. Hardware and software morph into an industrial "Internet of Things" (IoT)[8] (Ashton, 2009) in which materiality is tightly woven into a digital capillary braid that circulates ever growing flows of data.

6.2 Cars and Combines: "Roving, Metallic Algorithms"

Smartness is a function of connectivity, and the automotive sector presumably proceeds along the steepest vector of enhancing connectivity of industrial production and products (Paunov & Planes-Satorra, 2019, p. 24). On the level of production, the "smart factory" is the goal, and the extensive adoption of IoT-applications like connected robotics, machine learning and big data analytics for digital simulation and prototyping, predictive maintenance and supply-chain optimization are the means to that end (Büchi et al., 2020, pp. 10–12). On the product level, the automotive aspirations are focused on the "connected car" that generates data from the physical world, receives updates and connects to other cars and devices (Paunov & Planes-Satorra, 2019, pp. 8–9). Processing these data streams, then, promises efficiency gains in production and competitive advantage on the product market, and controlling these data flows in the ever more complex layered architectures of industrial platforms becomes imperative.

Volkswagen, the largest vehicle manufacturer (in terms of vehicles sold), for example, embarked on an ambitious €7bn program to build a software subsidiary (Car.Software) with 5,000 staff tasked with increasing the ratio of proprietary software in all 12 VW-brands sixfold (*Financial Times*, 2020c). This amounts to nothing less than to relinquish a key premise of the "asset-light" business model (as well as the erstwhile obsession with "lean production") for the sake of increasing control over data-streams and expanding in-house competencies in big data analytics. In a similar move, Volkswagen relegated the role of Siemens Mindsphere in developing a digital production platform (integrating the entire VW supply chain with over 1,500 suppliers in more than 30,000 locations) to a mere operative part that deprives Siemens of any strategic control over the platform (Butollo, 2019, pp. 13–14; Guggenberger et al., 2020). These maneuvers of Volkswagen exemplify a key feature of the platform economy to which Kenney, Zysman and Bearson (2020, p. 12) persistently allude to: platform architectures are built in a strikingly hierarchical fashion by those who control the nexus of relationships and data streams (Riasanow et al., 2020, pp. 9–10).

Agriculture, in comparison, proceeds along a flatter vector of digitalization than the automotive industry since the processes and routines of farming, at least in the segment of small and medium-sized operations, is still shaped by experience-knowledge and a traditional reluctance

8. To demonstrate the gravity of changes we are faced with in an unmistakable fashion, debates of the Internet of Things are routinely framed in a "rhetoric of rupture" (Fleming & O'Carrell, 2012) that proclaims nothing less than the "Fourth Industrial Revolution". Slightly more sober synonyms for the "Internet of Things" are, with varying geographies of adoption, "Industry 4.0" (coined first in Germany's industrial strategy plan), "Factory of the Future" (European Union) or "Industrial Internet" and "Advanced Manufacturing" (in the United States) (Büchi, Cugno, & Castagnoli, 2020; see also Butollo, 2019, pp. 1–3).

to adopt unproven technologies (Finger et al., 2020, p. 314). And yet, the prospects of significant gains in efficiency and efficacy (and the promise to proof Malthus wrong, once and for all) through the extensive adoption of IoT-tools and -infrastructures boosted the platformization of large-scale agriculture towards "precision farming" (Villa-Henriksen et al., 2020, p. 62). This agricultural version of an industrial Internet of Things, in fact, ushered in a new production paradigm that affords the treatment of a field as a *heterogenous* entity: site-specific sensing, sampling and management allows to address variabilities in yield potentials, topography, soil characteristics, nutrient demands as well as abiotic (e.g., weather) and biotic stressors (e.g., pest and weed infestations) (Finger et al., 2020, pp. 315–317).

The platformization of agriculture has produced complex architectures (Kenney, Serhan, & Trystram, 2020, pp. 14-16) that at least consist of a device layer (such as farming equipment, irrigation systems and drones), a network layer (that affords the socio-technical means for data capture, storage and transmission across all layers) and an application layer (for monitoring weather, soil and crop parameters, infestation and pesticide dosage, and machinery) (Alreshedi, 2019, pp. 99–100). The interconnectivity between these layers furnishes agricultural internets of things that afford — "seamless" is the magic term here — flows of data (Villa-Henriksen et al., 2020, pp. 63–64). And these data flows are massive: the leading provider in the device layer, John Deere, gathers 5–15 million data points *per second* from over 130,000 connected devices around the world (Kantor & van der Schaaf, 2019, p. 3).

6.3 Polanyi on the Farmland 4.0: Digital Enclosure and Double Movement?

By turning towards an emblematic piece of machinery at the device layer, John Deere's combine harvester, a dynamic of corporate enclosure und civic protest becomes visible that, in fact, resonates with Polanyi's commodification and double movement dialectics. John Deere's combine harvesters, those "factories producing both data *and* crops in increasingly exquisite detail" (Miles, 2019, p. 8), are equipped with spectroscopic sensors that monitor in real-time quality traits such as starch, moisture, protein or fiber (Finger et al., 2020, pp. 315–317); and the smart camera system of the "See and Spray" application is able to distinguish healthy and unhealthy crops as the combine passes through the field. These data are transmitted in real time to the cloud, merged and combined with data from other data sources, analyzed and transformed into "prescription maps" that are transmitted, frequently bypassing the farmer, directly to the combine — down to the individual nozzle of the spraying system (Kenney, Serhan, & Trystram, 2020, p. 22). While traditionally decisions about the dosage of pesticides and herbicides have been made on a field-by-field basis, this system calibrates dosage to the sub-field level of individual *plants* (Miles, 2019): precision farming indeed.

The agricultural Internet of Things, without doubt, offers potentials to benefit individual farmers by significantly increasing the efficiency in the deployment of inputs and enhancing the quantity and quality of the output. Moreover, by increasing the accuracy in the deployment of inputs to the sub-field level, the environment is expected to benefit through reduced pollution and greenhouse gas emission, for example (Alreshidi, 2019; Finger et al., 2020, pp. 314–315). What appears less equivocal, however, are the benefits of all the data streams for the key orchestrator in the device layer who, rather than a single (yet complex) piece of machinery, provides "roving, metal algorithms" (Miles, 2019, p. 8).

Although parts of the data stream can be leveraged by the individual farmer to optimize operations, John Deere collects data at a level of granularity that afford ever wider control over the agricultural Internet of Things and, in Polanyian terms, result in an extensive enclosure of

data.[9] Through proprietary software, for example, John Deere is producing "field maps" that, for the US alone, comprise 50bn data points about field conditions and topography (Kantor & van der Schaaf, 2019, p. 3), and that can be portioned into field-specific prescriptions profitably offered back to farmers (who, by the way, harvested these data in the first place). Moreover, "predictive maintenance" applications trigger machinery to be summoned to corporate service inspections — and maintenance and repair are six times more profitable than sales of original equipment (Waldman & Mulvany, 2020).

The datafication of the device layer in the agricultural Internet of Things, in general, has fundamentally altered the relation between machines and farmers (Kenney, Serhan & Trystram, 2020, p. 22): Since the software running the equipment is subject to IP protections, the notion of "ownership" of equipment is substantially hollowed out. Farmers, instead, rather "license" critical inputs and have to share critical data for free in order to leverage the benefits that the precision equipment providers propagate (Miles, 2019, p. 7). One implication of this licensing relation between farmer and equipment provider, however, sparked fierce resistance: the debarment from repair and modification.

Farmers are precluded from changing engine settings, retrofitting old equipment with new features and modifying accessory components; they are even precluded from re-setting immobilizer systems (comparable to re-starting your laptop after a program crashed) (Wiens & Chamberlain, 2018). The protest against this debarment from truly appropriating machines (that cost up to $800,000), though, has not been articulated by the rarefied circles of techno-libertarians at the US west coast claiming digital rights. Rather, it originated from grass-root farmer initiatives in Nebraska, right in the Farm Belt of the US, who oppose IP barriers that undermine the agrarian ethos of resilience and self-reliance (Waldman & Mulvany, 2020).

Their fight for the "right to repair" (agricultural equipment) has spread to over twenty US states and eventually forced John Deere and other providers in the device layer of platforms to some concessions, like access to service manuals, product guides, and on-board diagnostics (Wiens & Chamberlain, 2018). Most recently the campaigns of the farmers has gained increasing momentum within a broader movement for the "right to repair" that extend to automobiles, smartphones, refrigerators and even hospital ventilators (a most crucial element of the device layer in the fight against the COVID-19 pandemic) (*The New York Times*, 2020c).

And through this virtual excursion that took off in the England of the beginning Industrial Age and ends in the farmlands of Nebraska, we have come full circle. Although this farmer's movement from Nebraska can hardly compare with the Speenhamland legislation Polanyi was extensively referring to, they qualify, in fact, as double movement in a Polanyian (1944/2001, p. 156) sense: "if market economy was a threat to the human and natural components of the social fabric [...] what else would one expect than an urge on the part of a great variety of people to press for some sort of protection?"

9. The spectrum of data gathered from combines include "production data" (i.e. field task details; area worked; route travelled; crop harvested and yield data; agronomic inputs applied), "machine data" (machine health indicators, settings and readings; machine hours or life; machine location; diagnostic codes, software and firmware versions; machine attachments, implements or headers) and "administrative data" (data sharing permissions; users linked to the account; machines, devices, and licenses linked to the account; number of acres and size of files; information about account utilization) (John Deere, 2020).

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Platform Studies and Digital Cultural Industries

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Abstract

By providing a review of a number of recent and relevant publications, this paper reconstructs major trends, topics and challenges within the state of the art of scholarly research on the platformization of cultural industries, addressing the crucial role that digital platforms have acquired in recent years in the production and circulation of a variety of cultural contents. More specifically, after offering an introduction on the ways in which the study of digital platforms emerged as strictly intertwined with the evolution of certain cultural industry sectors, such as gaming and video sharing, the paper addresses in depth three distinctive domains of cultural production and consumption: music, journalism, and photography. In so doing, the paper traces a variety of perspectives beyond the mainstream political economy-oriented focus of platform studies, suggesting emerging paths for future research on these rapidly shifting and increasingly debated issues.

Keywords: Platform society; cultural production; music; journalism; photography; visual culture; Spotify; Instagram.

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1 Introduction: Cultural Industries and the Emergence of Platform Studies

In recent years, online platforms have quickly turned into a focal topic of discussion in several fields of the social, political and human sciences, where these technical artefacts have been recognized as crucial actors in reshaping and reconfiguring a wide array of activities and relationships. Within cultural industries, platforms have acquired a significant role and have increasingly affected the processes through which producers, intermediaries and industries create contents and organize their circulation. This essay aims to address the relationships between digital platforms and cultural industries by providing a review of a number of recent and relevant publications specifically related to three sectors: music, news, and photography, and in doing so, outlines major trends, issues and challenges within the state of the art of scholarly research.

The paper begins by outlining the fact that the analysis of cultural industries and cultural production has been instrumental, at the end of the 2000s, in both identifying platforms as an autonomous topic of research and in introducing novel perspectives, including the analysis of platforms' technological features. Then, after a closer look at the emergence of platforms studies as strictly pertaining to the reconfiguration of cultural industry sectors and to the notion of "platformization", the paper addresses more specifically three distinctive cultural sectors. *Music* represents one of the cultural sectors in which platforms had their earliest beginnings, and in a more integrated way, in playing a role in reshaping the industry's assets as well as listeners' practices. This has more recently become evident through examinations of the workings of Spotify, a major platform around which the whole music industry has been deeply reconfigured. In *journalism*, social media and platform companies such as Facebook, Twitter, and Google are considered increasingly influential in shaping the ways news is selected, organized and presented to readers, with a number of professional and public implications, including those which concern the adaptability of news organizations to the platforms' often changing algorithmic mechanisms and value hierarchies. *Photography* and *visual culture* are possibly the most recently emerging areas of inquiry for platform studies, which are starting to outline the impact of such increasingly popular digital platforms as Instagram on the everyday circulation of networked images, on the aesthetic forms of visual communication, and on some professional field values, e.g. photographic "objectivity" and "authenticity". Reviewing recent scholarly research on these topics enables us to trace a variety of perspectives beyond the mainstream political economy-oriented focus of platform studies, allowing us, in the conclusion of this paper, to suggest some relevant paths for future research on such rapidly emerging and increasingly debated phenomena.

To start with, it is worth noting that in the last couple of years a relevant turn in the debate on platforms in the social sciences has been provoked by the publication of the book *The Platform Society. Public Values in a Connective World* by van Dijck, Poell, and de Waal (2018), in which the authors intersected issues typical of political economy of communication with a Science & Technology Studies framework. This approach fostered an understanding of the interconnection between technical mechanisms characterizing today's Western platform ecosystem and their social and political consequences. In doing so, the authors also popularized the notion of *platform society*, defined as a distinctive society "in which social and economic traffic increasingly channelled by an (overwhelmingly corporate) global online ecosystem is driven by algorithms and fueled by data" (van Dijck et al., 2018, p. 4). However, while the overall framework articulated in the book represents a comprehensive view on the role and mechanisms of platforms in several sectors of society (including urban transport, healthcare, and education), its only significant reference to cultural production and media industries regards the news me-

dia sector, leaving out of this discussion the fact that platforms first and foremost affected the ways in which culture is produced, circulated, and consumed.

In order to address the relationship between platforms and cultural production, a step back in time may be useful, as this would allow us to outline how the very beginning of social inquiry on platforms has been strictly intertwined with the reconfiguration of cultural industries and the ways in which cultural content has been produced and distributed online since the emergence of so-called "Web 2.0." Indeed, the very origins of what we can define as the proper field of *platform studies* were rooted in the analysis of the evolution of the gaming sector. The work that more than any other has contributed to popularizing the analysis of platforms as a distinctive approach to gaming, and more broadly, to cultural contents mediated through digital machines, has been the seminal book *Racing the Beam: The Atari Video Computer System*, by Nick Montfort and Ian Bogost (2009). In this study, the authors charted the development of a distinctive platform in the gaming sector, the Atari 2600, which was developed by the Japanese firm Atari in the late 1970s and remained very popular up to the mid-1980s, focussing distinctively on the relationship between a platform intended as "the hardware and software design of standardized computing systems" and the "creative works that have been produced on those platforms" (Montfort & Bogost, 2009, p. 2). Although mostly limited on the ways in which the technical features of the Atari 2600 platform influenced the form and aesthetics of gaming, nonetheless this book paved the way for other analyses on different informatics platforms (e.g. Jones & Thiruvathukal, 2012; Salter & Murray, 2014; Custodio, 2020), pushing the social and cultural analysis of videogames from a dominant content-based focus towards a novel sensitivity for the technical dimensions of digital systems, already common in software studies focused on coding, programming and protocols.

If software studies contributed to identifying platforms in their proper technical dimensions, through which it is possible to investigate the changing dynamics of content production, a further step in developing the social study of platforms emerged again in relation to another cultural industry sector — more specifically the realm of video sharing. Focusing especially on YouTube, Tarleton Gillespie (2010) triggered a wide debate on platforms by outlining their ideological dimensions within a media industry world undergoing rapid changes. First of all, Gillespie outlined the strong metaphorical power that the term "platform" had acquired in our society, its adoption in everyday language for different purposes, and outlined in this way how the word has been in recent years at the centre of a wider process of re-semantization, exceeding computers and software sectors. More specifically, Gillespie also outlined how technology companies like Google and Microsoft were among the first to use the term "platform" to identify their media services. For instance, in 2006, when Google bought the video sharing platform YouTube, the definition of this service that circulated through the company's press releases marked an important semantic transformation, as for the first time YouTube was no longer described as just a "website" or a "community", but more distinctively as a "distribution platform for original content creators and advertisers large and small" (Gillespie, 2010, p. 348). From that moment on, technology companies, especially those related to cultural industry sectors, appropriated the term "platform" to describe their services as "open", "flat" and "neutral" spaces, on which anyone could act without differences or discrimination. In sum, it was during the reconfiguration of cultural industry sectors, and as consequence of the emergence of more interactive tools available to produce and share cultural contents, that digital media industries adopted the term "platform" as part of a broader rhetorical strategy to publicly present themselves as neutral aggregators that connect content producers and consumers.

In a very short period, it has been widely recognized that cultural industries and cultural

production have been deeply affected in different ways and at different levels by both general platforms (like Google or Amazon) and sectorial platforms which are active in the circulation of distinctive kinds of digital cultural content. While we will focus this paper's following sections on music, news, and photography sectors, it would clearly be possible to address other contexts in which the rise of platforms has quickly reconfigured the way cultural contents are created and distributed — e.g. in cinema, with the rise of Netflix as a disruptive actor in relation to the funding of film production, the logics of their distribution, as well as the practices of their consumption (Lobato, 2019; Siles et al., 2019; Hadida et al., 2020).

In this broad framework, an emerging notion which addresses the whole set of transformations produced by platforms that are affecting cultural industries is that of *platformization*, adopted by Helmond (2015) and then Nieborg and Poell (2018) to define the "penetration of infrastructures, economic processes and platform rules in various sectors of the economy and daily life" (Nieborg & Poell, 2018, p. 4275). The platformization of cultural production implies a whole reorganization of cultural practices and also of the ways in which it becomes possible to conceive and understand the role of platforms for cultural circulation. In this reconfiguration, digital platforms acquire an increasingly integral position in influencing the popularity of artists, in making their work visible and in establishing the possibility for consumers to access cultural products. Authors focusing on the notion of platformization pay special attention to the exploration of the computational back-end of platforms, for instance by looking at how platforms exercise control over third-party developers through the management of infrastructural features, such as APIs (application programming interfaces) and software development kits (Helmond, 2015). The analysis of the platformization of different sectors connected to cultural industries and cultural production has very recently been catalyzed as an emerging strand of research, which has been collected in two relevant special issues of the journal *Social Media + Society* (Duffy et al., 2019; Nieborg et al., 2020) and which will soon be systematized in a dedicated book on platforms and cultural production (Poell et al., 2021).

These seminal works on the role of platforms in relation to different sectors and issues connected to cultural industries recall two basic and propaedeutic points. First, digital cultural sectors have been at the foreground of the wide set of transformations that led in the last couple of years to the rise of platforms as crucial actors in a wider reconfiguration of the organization of contemporary society. Second, along this process, the initial studies of digital cultural industries' transformation were instrumental for the development of new relevant issues, perspectives and concepts related to cultural industries, but are also potentially fruitful in the wider study of platforms in different social domains.

2 Platforms and Music

Looking at the intersection between platforms and digital cultural industries, music can be definitively considered a paradigmatic sector: on the one hand, historically, the music sector had been affected from an earlier point in time and more deeply by digitalization, at least since the rise of the first generation of music distribution websites which emerged in the early 2000s — first of all through Apple's iTunes, at that time the major seller of MP3 music files worldwide. On the other hand, music had been soon identified by several media scholars as a sector in which the early consequences of platformization could be identified more clearly, for instance through the investigation of today's main music platform, Spotify (e.g. Marshall, 2015; Prey, 2016; Vonderau, 2019). While, in the pre-Spotify age, several scholars outlined that the emergence of integrated infrastructure centred on the MP3 format was crucial in reshaping

the music industry's organization and the cultural construction of music value (Sterne, 2012; Morris, 2015; Magaudda, 2011), the actual music industry ecosystem, cantered on a major platform like Spotify, offers a useful entry point to understand the different layers on which platformization can unfold its consequences on different levels.

The most relevant study so far about Spotify is the work of a team of Swedish scholars, who collected their main findings in the recent book *Spotify Teardown* (Eriksson et al., 2019). First of all, the authors put together a detailed story of this platform, one able to unveil to what extent music is now part of a larger global system in which platforms play a key role, which outlines how this platform's trajectory exemplifies the wider logic of financialization that has characterized the logic of digital platforms over the past decade (Eriksson et al., 2019, p. 31). Indeed, the authors documented the evolution of Spotify from being a sort of "underdog" music service, strictly connected with the file-sharing scene and the online piracy environment, to a global corporate firm, based on financialization and on the commodification of music through datafication and the exploitation of users' behaviours.

Spotify was founded in 2006 in Stockholm by two young digital entrepreneurs, already turned millionaires in previous years thanks to the launch of other start-ups related to online advertising. As the authors argue, although the success of Spotify was mainly linked to the idea of offering a legal and profitable digital music distribution model for record labels (unlike previous file sharing networks, like Napster), in the early years of the platform's business, until the launch of an official version in 2008, Spotify exploited the advancement in peer-to-peer technology already adopted by the pirate-related file sharing communities, relying on a vast unauthorized music catalogue previously shared by users of illegal file sharing networks (Eriksson et al., 2019, p. 45).

Spotify's financialization process represents an interesting case for us to understand how the creation and distribution of cultural content is nowadays closely intertwined with business models based on global financial flows typical of the platform society. As media scholar Patrick Vonderau (2019, p. 6) points out, "Spotify is not simply a music streaming service, but represents a media company, operating at the intersection of advertising, technology, music and — above all — finance". In other words, the case of Spotify can reveal the tensions and contradictions characterising platforms, involving, on the one hand, their pre-eminently financial nature, and, on the other hand, their tendency to identify their identity with progressive and democratic social values, well represented by Spotify's slogan "music is for everyone".

Another relevant contribution by the aforementioned team of Swedish researchers is that they attempted to unveil some of the opaque internal mechanisms of Spotify, developing innovative methods to "teardown" the platform and to bring to light their technical features. In doing this, such research also makes manifest the methodological challenges raised by inquiring on private-owned platforms and their internal work and technologies, in this case complicated by the fact that the platform, after an initial partnership, refused to offer any collaboration or disclosure on such matters. As a consequence, in order to bring to light Spotify's mechanisms and to collect data on how algorithms and data management work, the researchers had to rely on experimental research methods, including the use of bots and the creation of fake record labels.

While *Spotify Teardown* clearly remains a scholarly masterpiece within platform studies, it is worth noting that the debate and inquiry on the rise of platforms in the music sector has been quite varied. One of the major sub-topics considered by several scholars is certainly the role of data and their active management by platforms, especially exploring the consequences of "datafication" for music circulation. With contemporary music streaming services like Spotify,

every song we listen to or skip is tracked and then used by algorithms to organize music contents, to differently manage their visibility, and especially to build playlists.

A major example of how datafication contributes actively to shape how music is organized and presented to consumers, on the basis of the analysis of their tastes and preferences through algorithms and data, is the Echo Nest system, adopted by Spotify in 2015 in order to tailor its music streaming flows. As addressed, among others, by Robert Prey (2016), in 2015 following the acquisition of the start-up Echo Nest, specialized in the selection of digital music content, Spotify launched a personalized playlist service, called *Discover Weekly*. This playlist consisted of a selection of around two hours of music, offered every Monday and tailored on individual users' tastes thanks to the analysis of big data through a dedicated system of artificial intelligence and machine learning. The composition of playlists offered to listeners is clearly one of the core dimensions in which the power of music platforms like Spotify can be located, as playlists represent the main feature through which platforms such as Spotify put to work the "selection" of contents, a process recognized by van Dijck, Poell, and de Waal (2018) as a key mechanism through which platforms attempt to shape and control their sectors.

Consequently, a crucial dimension of inquiry in music platformization regards how the work of selection is performed, and how playlists are created. While Spotify offers musicians and labels a simple, generic description of how songs are selected to enter the strategic playlists composed by the platform, this process remains largely opaque. Indeed, as showed by Bonini and Gandini (2019), the outcome of this crucial work of gatekeeping done by the playlists is the outcome of a mix between, on the one hand, automated data coming from listeners' behaviours relating to engagement (such as listening duration or skip rates) and, on the other hand, an active curatorial work by the staff. There is therefore no method, or data available for an artist to know how tracks are placed or withdrawn from playlists. As a result, as Prey (2020, p. 3) argues, one direct consequence of the platform's mechanisms is that "music artists and record labels are growing increasingly dependent on plum playlist positions — playlists controlled by Spotify". In any case, far from being merely the outcome of an automated process performed by algorithms, the gatekeeping process represents an "enhanced" work of selection, in which professionals are helped by algorithms, big data and other tools, to be able to control content circulation in a powerful way, showing — as Bonini and Gandini (2019, p. 9) underline — how "the platform capitalistic model [is] potentially more efficient than industrial capitalism in transforming audience attention into data and data into commodities".

In this regard, we can also look at the way in which the early phase of adoption of blockchain-based platforms for music distribution have been largely influenced by pressures related to music financialization and further commodification of sonic content (Magaudda, 2018). The emergence of platforms distinctively based on blockchain, smart contracts and automated algorithms shows that these emerging technologies are remarkably shaped by the need to incorporate ownership and copyrights into protocols and digital formats, integrating music content even more into the automated flow of big data characterizing our hyper-connected society.

A final reflection worth noting concerns the situated consumption practices of platforms' users and, therefore, also on the possible forms of resistance that they can put in practice to counterbalance the strong power exerted by platforms through datafication and algorithmic selection. In a widely variegated music platform ecosystem, one basic possibility for consumers is to choose different platforms among the several available today in order to listen to music. Indeed, such platforms as Bandcamp or Soundcloud, alternative to mainstream services like Spotify, offer a different relationship with musicians and listeners, employing a different kind of

management of data, which is the result of a lower degree of dependence on financialization and marketing (Hesmondhalgh et al., 2019). These alternative platforms "have become the principal site for 'alternative' music", presenting "positive values and emancipatory aspirations", but, at the same time, "like older forms of alternative cultural production and distribution, these services are compromised and problematic", for instance in their struggles to be economically sustainable or in ambiguously translating their alternative ideologies into the technical features of the platforms (Hesmondhalgh et al., 2019, p. 10). The adoption of alternative music platforms together with other forms of tactical resistance against platforms' power (e.g. Siles et al., 2020) suggests that an alternative kind of digital music industry can be imagined and that, at least to some degree, consumers can always potentially put in practice autonomous patterns for the fruition of digital contents.

3 Platforms and Journalism

As the significant number of dedicated scholarly monographs and journal special issues published in the last very few years clearly suggests, the impact of digital platforms in the field of journalism — that is, the complex and dynamic roles played by social media and platform companies such as Facebook, Twitter and Google in the reconfiguration of the processes of news production, circulation, and consumption — constitutes both a central issue within the scholarly field of journalism studies as well as a key domain through which to investigate the wider platformization of contemporary culture and society.

In the following sections, a few major and interrelated research strands will be reconstructed. First of all, it is necessary to note that recent research on platforms and journalism has been struggling to strike a balance between, on the one hand, embracing — theoretically, empirically, and critically — elements of discontinuity and even radical technological change and, on the other hand, recognizing elements of continuity. In other words, the real weight of the impact of platformization in the field of journalism is still matter of debate. Indeed, the fact that algorithmic and data-driven platforms do not explicitly self-identify as such and are not often publicly perceived as media companies nor constitutive actors within the global news media ecosystem has somehow generated confusion and thus posed new interpretative challenges about their societal position, responsibility, accountability, and power.

In this context, there can be no doubt that the accelerated and impactful transformations of news media industries have stirred up innovative research on the specific forms and mechanisms of the platformization of journalism, that is, on news (and) *platforms* (e.g. Van Dijck et al., 2018; Rashidian et al., 2019; Bell et al., 2017; Paulussen et al., 2017), *algorithms and automation* (e.g. Thurman et al., 2019; Duguay, 2018), *audience metrics and analytics* (e.g. Christin, 2020; Carlson, 2018a; Cherubini & Nielsen, 2016) — readdressing long-debated yet newly relevant issues of journalism's *value and values* (e.g. Anderson, 2020; Van Dijck et al., 2018; Peters & Broersma, 2016). In particular, certain relevant research results show how news media organizations are becoming not only responsive to specific platform logics (embedded in concrete mechanisms such as metrics and analytics) but also more profoundly adaptable to the platforms' value hierarchies and their frequently redefined strategies — in what can be interpreted as a form of *institutional isomorphism* (Caplan & boyd, 2018). As a whole, on the basis of the reconstruction of major research strands on the topic, it could be argued that scholarly choices of privileged research objects on platforms and journalism have advanced by focusing more on political economic issues, organizational structures and technological aspects, and ar-

guably less on symbolic meanings and user practical experiences — as the conclusions of this section will suggest.

As a recent special issue reflexively claimed (Peters & Carlson, 2019), among the various interdisciplinary subfields of academic inquiry on culture and communication across the social sciences, journalism studies are arguably one of the subfields most commonly accustomed to researching and debating on issues of *change*. Presenting a variety of even contested epistemological positions on the ongoing, incremental, sometimes declared as "disruptive," technological (r)evolution,[1] journalism studies seem constitutively doomed to a persistently preparadigmatic stage characterized by a productively unstable balance between continuity and transformation. Over the last two decades, in particular, the pace of change and the reconfiguration of wide sectors of social and cultural life through new and constantly evolving digital media technologies have posed deep challenges to the field of journalism, revealing increasing complexities (Boczkowski & Anderson, 2014; Tong & Lo, 2017). In this context, on the one hand, there can be little doubt that "the *stability* of journalism's core — the idea that individuals associated with certain recognized and reliable enterprises are entrusted with collecting and disseminating information for the public good — *matters*" (Zelizer, 2019, p. 346, emphasis added), and arguably even more so in today's complex times and global crises. On the other hand, as it is now clear, the infrastructural organization of the current hegemonic platform ecosystem is founded on business models that focus specifically on valuable data extraction and processing, user profiling, and personalized targeted advertising. Such business models accordingly take form in the operational platform structure by symbiotically comprising the backstage of algorithmic systems and the frontstage of web interfaces, the latter of which are strategically designed to keep user engaged and to maximize their online presence and activity. As many authors have underlined over the last few years within critical accounts of major shifts regarding the convergence between digital media practices and data extraction and analysis technologies at the core of the contemporary capitalistic shaping of the social order, these apparently inextricable and inescapable platform value-creating mechanisms end up at odds with both individual privacy and several foundational societal and professional values (Turow & Couldry, 2018; Van Dijck et al., 2018; Couldry & Mejias, 2019; Zuboff, 2019) — as has become evident in the journalistic field over the last decade.

In fact, and not by chance, among the major sectors impacted by the process of platformization, Van Dijck, Poell and de Waal's timely book (2018) focuses first on news and journalism. Contextualizing the recent digital evolutions of the news field through the book's conceptual framework, built around the three key platform mechanisms of datafication, commodification, and selection, the authors define the increasingly extensive process of platformization of news as a contested process involving a number of actors and reciprocal tensions between, on the one hand, infrastructural platforms "making extensive efforts to become central nodes in the production, circulation, and commodification of news by developing new data services and news-related features", and, on the other hand, "a wide variety of online news content producers — from legacy media organizations to producers of disinformation" that "target online platforms to distribute and monetize their content". As a consequence, such a tension most significantly implies that "the production of news becomes progressively tailored to obey the mechanisms and organizing principles driving the platform ecosystem", while for a number of professional, economic and juridical reasons the platforms explicitly distance themselves from any official recognition of "their editorial function and responsibility in the news sphere". According to

1. On the digital "disruption" of journalism, see Hansen (2020). On the digital "(r)evolution" of photojournalism, see Solaroli (2017).

the authors, these economic and technological developments are reshaping not only practices of production, distribution and consumption, but most relevantly socially constructed core public values — such as journalistic independence as well as accurate and comprehensive news coverage — that have historically defined journalism's professional identity and societal role in democratic politics. In other words, with the increasingly personalized, profiled and targeted practices of news media consumption, which can also isolate platform and social media users within social and ideological filter bubbles, "the realization of such values comes under pressure in the platform ecosystem", where platforms, social media and online search engines undermine both "the control of news organizations over the selection of news" and, fundamentally, "the privileged position of professional journalism" (Van Dijck et al., 2018, pp. 50–53; see also Schiffrin, 2021).

A relevant part of the scholarly discussion on platform journalism focuses on the multiple and interrelated relationships between new(s) strategies of content format curation and audience engagement based on digital metrics and analytics. Drawing on previous research (e.g. Anderson, 2011; Usher, 2013), Van Dijck, Poell, and de Waal (2018) recall that "due to the many different paths through which today's audiences consume news and leave a data trail, a wealth of audience metrics have become available, spawning a number of measurement and data services", as it has become "essential for news organizations to trace how each piece of separate content circulates online", even if, in terms of public value, "a fully data-driven news production and distribution process potentially conflicts with journalistic independence and comprehensive news coverage, putting additional commercial pressure on journalists to produce content that triggers user engagement", creating path dependencies through which the data infrastructures of the larger platforms can eventually "shape the scope of editorial decision-making [...] in terms of topics to focus on and reconfiguring the presentation of content" — for example, helping professional journalists to "surface relevant trends, photos, videos and posts from Facebook and Instagram" (Van Dijck et al., 2018, pp. 54–55).

In other words, the digital platformization of news making and consumption necessarily implies a potentially major shift from the foundational principle of (relative) editorial autonomy pertaining to the work of professional journalists as cultural intermediaries (e.g. Matthews, 2014) to an increasingly data-driven, socio-technological personalized selection model shaped by online user behaviors and news consumers' assumedly preferred interests (e.g. Nielsen & Ganter, 2018). As it is becoming clear, such a shift eventually has practical consequences also on the production, design and circulation of news contents, formats and types (e.g. infotainment and breaking news) that can acquire visibility and even virality by soliciting emotional responses and augmenting quantifiable online engagement (Van Dijck et al., 2018, p. 65) — in digital jargon, "capturing" or "hooking" (hence monetizing) users while monitoring their "sentiment" — thus also requiring renewed analytical frameworks to study the enduring yet increasingly debated role of emotions in the platform society and the affective dimension of digital journalism (Wahl-Jorgensen, 2019).

In all its technological and professional peculiarities as well as economic and cultural implications, such a shift could actually be interpreted as the last digital step in a much longer historical trajectory of journalism's orientation towards the heteronomous pole of the field of cultural production (Bourdieu, 2005; Benson & Neveu, 2005) — a step that consequentially implies a reshaping of its own digital "form of news" (Barnhurst & Nerone, 2001), and that would thus greatly benefit from further multidimensional and critical empirical research on the processes, effects, and meanings of news platformization at the intersection of field dynamics, online news formal design patterns, and news' emotional consumption.

Most recently, empirical research on platforms and journalism has particularly focused on different dimensions of the shifting balance between professional journalists and platform algorithms, as well as on the connected and increasingly practical and symbolic relevance of digital audience metrics and analytics. Within the journalistic field, the increasing possibility and need to process huge amounts of digital data highlight the growing, yet hardly visible, relevance of algorithms and various mechanisms of automation in the process of news production, selection and distribution. Among their many emerging uses, algorithms are in fact increasingly adopted in newsrooms to identify and filter newsworthy contents on digital platforms, while a variety of automated mechanisms can contribute to editorial choices based also on news consumers' profiles and online behavior — though clearly not without technical and cultural failures and, most relevantly, not without wider increasing ethic-political implications (Thurman et al., 2019; Gillespie, 2020). The algorithmic processing of valuable data extracted by online user activity can support journalistic organizations in tailoring their contents and targeting audiences on platforms — giving web analytics companies from outside the journalistic field increasing power and influence on the newsmaking process (Belair-Gagnon & Holton, 2018; Petre, 2018).

Journalism today is not systematically driven by algorithms and audience metrics, but it can certainly be argued that, with the rise of digital platforms, over the last decade algorithms and various forms of audience quantification have ubiquitously proliferated and acquired increasing transformative prominence within the journalistic field (Carlson, 2018b; Anderson, 2011) — extending what already in the mid-nineties Bourdieu (2005, p. 43) aptly defined as the "audience ratings mentality" increasingly governing the journalistic field under the pressing forces of commercial heteronomy (see also Wang, 2018). Such a prominence is based on the constitutive tension between, on the one side, the possibility for news audiences to participate and be "engaged" with through platforms, as well as for journalists to understand more of their audience, and, on the other side, the commodification of audiences made possible by online traceable data, through which they eventually become individually targetable and fundamentally reduced to mere valuable "profiles". Furthermore, under pressures for productivity and in seeking web traffic journalists can fall into forms of professional and cognitive dependency on metrics outputs — sometimes discursively framed even as "click hysteria" (Steen-Johnsen et al., 2016).

In this context, the recent empirical work on the "metrics at work" in the journalistic field by Christin (2020) provides a number of valuable insights that can aid us in going beyond merely descriptive dichotomies of audience analytics in order to investigate the differently situated uses and negotiated meaning-making processes around algorithms and digital metrics — as practical digital tools and also dense cultural symbols — as well as their impact on professional identities and modes of evaluation in contemporary digital journalism. The ethnographic method and comparative design of the research — carried out also through significant in-depth fieldworks within offices of news websites in the US and France — as well as the theoretical framework — that enriches more traditional Bourdieusian analysis of the journalistic field with an empirical attention to the relationships between journalists and their (algorithmic) publics — allow us also to recognize important cultural differences between the two national journalistic fields, while reconstructing and interpreting the workings of globally available digital metrics in practice (see also Christin & Petre, 2020).

On this basis, it is critically important to note that the changes to traditional news editorial practices, standards of evaluation, and audience engagement strategies such as those enacted by digital metrics and analytics take place in a platformized media environment in which the

rules of the game and the spaces of opportunities often come to be performatively defined by these same platforms. In other words, news media organizations do not simply respond to the metrics and analytics; they also tend to adapt to the platforms' value hierarchies and their frequently re-updated strategies — in what, drawing on DiMaggio and Powell (1983), and focusing on the primary role of Facebook within the news media ecosystem, Caplan and Boyd (2018) have interpreted as a form of institutional isomorphism. As they write,

> Facebook itself has used its News Feed algorithm, and changes being made to it, to exert powerful coercive pressures on organizations operating within its walls. Evidence that news media organizations are subject to the informal and formal pressures Facebook's platform places upon them can be seen in their relative success following changes to Facebook's News Feed algorithm. Publishers that had early success in News Feed effectively subsumed their own organizational practices to the logic of Facebook's algorithms (Caplan & boyd, 2018, p. 5).

However, over the last very few years, a significant number of frequent changes in the algorithmic mechanisms and platform strategies of Facebook — such as its choice in January of 2018 to favor updates from friends and family and give less priority to publisher posts on the News Feed — brought relevant drops in traffic and advertising revenues for news media organizations. Not by chance, since 2019, and following the expansion of such projects as the Google's Digital News Initiative, Google and Facebook have started to significantly fund various (particularly local) news initiatives. As a consequence, today, on the one hand, "platforms are more powerful than ever. Over time, they have come to control the online information ecosystem and, increasingly, in the case of Facebook and Google, are among the news industry's top funders"; on the other hand, "the lesson of platform unreliability, particularly when it comes to revenue, has never been more clear to publishers [...] From the rise of paywalls and reader revenue initiatives to the diversification of revenue streams through live events and podcasts, publishers are attempting to regain control over the future of their businesses" (Rashidian & al., 2019, pp. 5–8).

Finally, on the basis of this reconstruction of the state of the art, it becomes clear that, within the rapidly expanding scholarly literature on platforms and journalism, the bulk of research has focused on the multiple effects of algorithms, automation and audience metrics and on the wider digital transformation of news production, leaving relatively aside the investigation of news consumption. Over the last few years, a number of authors have highlighted the urgency of giving proper analytical and empirical attention to the changing practices, forms and motivations of news consumption, as well as to the crucial object itself — in other words, what is socially and culturally considered, consumed, and valued as news today (e.g. Waisbord, 2019; Peters & Witschge, 2015). Such a form of attention has been taking shape more recently (e.g. Picone, 2016; Larsson, 2018; Mukerjee et al., 2018; Peters & Broersma, 2019), advancing the call for an "audience turn" in digital journalism studies, and suggesting the relevant possibility to further explore the question of what constitutes meaningful news user experience and engagement today (Meijer & Kormelink, 2020) — a question with relevant political and cultural implications. In Zelizer's words:

> the widespread reliance in digital journalism on a certain kind of audience metrics — exemplified by clicks, pageviews, likes, shares, retweets and followers — leaves unclear how to discern or measure participation. As its invocation in digital journalism ranges across sheer digital activity, time spent on particular sites, comprehension, learning and social mobilization, it is clear, as Poindexter (2012) pointed

> out in her study of millennial news users, that engagement without a connection to broader values often leads to disengagement and disinterest (Zelizer, 2019, p. 348).

4 Platforms, Photography and Visual Culture

If compared with music and journalism, photography and visual culture could certainly be argued to represent the most recently emerging domain of inquiry for platform studies. Over the first two decades of the twenty-first century, the large-scale digitalization of processes of visual production and consumption and the global rise of visual social media have been challenging and redefining ways of seeing, social practices, and cultural expectations in a variety of professional fields and in wider public visual culture. Over the last very few years, in particular the process of platformization has had a number of still largely unexplored effects, at different levels, on the everyday production, circulation, and consumption of networked images. Concluding a recent historical reconstruction of photography as a cultural industry, Frosh (2020) has indeed suggested that:

> Probably for the first time in its history, photography has shifted operations away from a "publication" model based on the value accrued through the sale of images or image-making technologies, replacing it with a computationally enhanced "broadcast" or "network" system focused on new commodities: viewer data, viewer attention and the prediction of future viewer behavior [...] an epochal shift from the mass manufacture of pictures to the mass processing of viewers (Frosh, 2020, p. 269).

In order to start grasping the degrees of innovation and (dis)continuity related to the ongoing process of platformization of visual cultural industries, the next few sections will focus on some of the major issues emerging within the scholarly state of the art — in particular, on the ways in which the circulation of photographs is increasingly enacted through such online platforms as Instagram (clearly, even beyond the practice of *selfies*); on the aesthetics of visual communication, which is increasingly subjected to patterns of platform templatization and forms of platform vernaculars; and additionally on such socially constructed values as visual objectivity and authenticity, historically related to the practice of photography within a variety of professional fields (e.g. news and documentaries) but which are now increasingly reshaped and interwoven with data-driven and algorithmic mechanisms within the platformized visual media environment.

It is worth noting that today, almost sixty years since Bourdieu (1990[1965]) led his pioneering research team to empirically investigate the class-based and context-dependent social uses and meanings of (analogue) photography, the symbolic boundaries and overall extension of what was at that time defined as the "photographable" domain has come to be broadened, while the socially constructed and ritualized "occasions for taking photographs" have turned out to be not just mediated but vastly multiplied, ordinarily experimented, even strategically induced. "Since the beginning of the new millennium", as rightly observed by Van Dijck (2008, p. 60), "cameras have increasingly served as tools for mediating everyday experiences other than rituals or ceremonial moments". The everyday circulation of networked images and the uses of visual social media platforms to communicate and share contents and experiences — and thus to manage and expand interactions and relationships, to acquire and debate information and knowledge, and to build and promote (branded) identities — have been argued to constitute

an increasing shift toward an "ubiquitous" (Hand, 2012), "conversational" (Gunthert, 2014), and "social (media)" (Jurgenson, 2019) character of contemporary photographs and images.

Among the visual social media platforms that have emerged over the last decade, Instagram has proved particularly successful, through its frequent changes and updates (even those implemented in imitation of other platforms' existing features, including the gradual introduction of videos and "stories") as well as its consistent growth.[2] In 2016, Instagram made a crucial shift from displaying posts on user feeds in chronological order to a data-driven and algorithmically-shaped model based on criteria designed to provide a more personalized (that is, commodified and targeted) visual experience. As a central actor within the contemporary platform ecosystem, Instagram has been a revealing and sometimes driving force in a number of wider trends in online social experience and visual communication, raising a number of questions on the ongoing platformization of visual cultural production and consumption, and thus becoming, over the last few years, the object of increasing scholarly attention (Manovich, 2017; Serafinelli, 2018; Leaver et al., 2020; Caliandro & Graham, 2020).

An initial and prolific strand of research on visual social media, Instagram, and contemporary visual culture has focused on the social practice and cultural object of the selfie, investigated also in relation to the increasing public attention on such a rapidly diffusing trend of visual self-representation and promotion (Senft & Baym, 2015; Warfield et al., 2016; Peraica, 2017; Eckel et al., 2018; Tiidenberg, 2018). Going beyond naive debates on (youth) narcissism, and often theoretically framing the selfie as a diversified reaction to the so-called "context collapse" (Marwick & boyd, 2011), such research has addressed a variety of dimensions, sub-genres and case studies, from the selfie as a form of expressive empowerment for specific subcultures and social groups (including migrants and refugees, e.g. Serafinelli, 2016; Chouliaraki, 2017), to wider trends on selfies by/with politicians or celebrities (e.g. Jerslev & Mortensen, 2016; Karadimitriou & Veneti, 2016), and to large quantitative explorations of selfies' visual-aesthetic patterns (Manovich & Tifentale, 2015).[3]

Over the years, even beyond selfies, major scholarly attention has been somewhat predictably devoted to the dimension of aesthetics, and its shifting forms in relation to multiple social and professional practices of platform users. As a renewed step in a longer process of aesthetization of cultural production, the visual communication and online sharing of social experiences via smartphones and visual social media had initially been addressed by focusing on Instagram image filters — which simulated, for example, old Kodak Instamatic or Polaroid-like analogue film textures and borders — and the vintage and retro-aesthetic appeal of such imagery. According to Jurgenson (2019), these "filtered images conjured a sense of special realness amid the mass of digital photos. Faux-vintage photos placed one's self and one's digitally mediated present into the context of the past and its overtones of the authentic, the important, and the real" (Jurgenson, 2019, p. 6), since "visual communication is increasingly accommodating the sharing of experience in addition to and through the mechanism of recording information", and thus "social photography, even or especially those

2. Founded in 2010 and acquired by Facebook in 2012 (for one billion dollars), in 2018 Instagram declared itself to have reached one billion monthly active users.

3. In what might be seen as a classic framing exercise, on the one hand it is argued that "the prominence of the selfie as a genre on Instagram — over 366 million posts tagged with #selfie as at November 2018 — means that is important to explore as part of the aesthetics and vernacular of the platform" (Leaver et al., 2020, p. 67), while, on the other hand, as the counting goes, "of approximately 40 billion photos posted on Instagram to date, only 282 million are selfies — just 0.7%. Thus, for all its zeitgeisty appeal, the selfie is in fact a niche phenomenon in the larger context of Instagram genres" (Caliandro & Graham, 2020, p. 1) — highlighting, as a consequence, the need to study Instagram even beyond selfies.

photos that are filtered and framed and digitally augmented, can succeed at storytelling rather than fail at exactitude" (Jurgenson, 2019, p. 17).

However, over the years and increasingly in the second half of the 2010s, "the retro-specific aesthetic was minimized in comparison with the broader visual opportunities and possibilities of Instagram, as its user base grew and the uses of the platform expanded" (Leaver et al., 2020, p. 39). On the basis of an empirical research on Instagram users, Serafinelli (2018) claims that "users' way of viewing the world has changed since their first approach to Instagram, and this shows how Instagram alters the visual perception and experience of the surroundings"; more specifically, the progressive use of the platform reveals "two types of changes: one is related to the improvement of photographic skills and the other is related to the development of the connection with the surroundings". In other words, Instagram users can tend to search for and create "Insta-worthy" photo-opportunities, and such an extended visual attention can even change their attitudes towards and during events (Serafinelli, 2018, pp. 67–69) — which come to be experienced also, as the user jargon goes (and even a number of recent popular culture products, from movies to pop songs, recall), "for the gram".

At the same time, the platformized visual economy of attention is argued to have evolved on the basis of a social process of algorithmically-driven *visual templatability*: "Instagram use has shifted from a focus on filters to an era of templatability where new aesthetic and communication norms are established by celebrities and Influencers that ripple through the platform, establishing the fleeting vernacular norms of the day" (Leaver et al., 2020, p. 6). Reciprocally, such a "seeming dominance of similar and repetitive visual stylings shows a growing logic of templatability driven by the metrics and algorithms driving Instagram today" (Leaver et al., 2020, p. 191). As a consequence, Instagram visual culture takes the shapes of a *platform vernacular*, or better a repertoire of multiple platform vernaculars, defined as a platform's "own unique combination of styles, grammars, and logics" which "emerge from the affordances" (built into the hardware and software architecture of the platform) "and the ways they are appropriated and performed in practice" by its users, on the basis of their own communicative habits and goals (Gibbs et al., 2015, p. 257). Such a definition recalls earlier interpretative explorations of "new" visual media such as PowerPoint, whose affordances have made possible repertoires of cognitive styles and expressive formats, thus being — as showed by Stark and Paravel (2008) — "pre-scriptive" in the sense that they can contribute to pre-form (that is, limitedly enabling, not clearly determining) the performance of users.

On this basis, it becomes important to embrace notions of templatization with a degree of caution and to empirically reformulate them in more detail on the basis of different social and cultural contexts — as experimented, for example, in early work on Instagram by Manovich (2017), which employed large scale computational and qualitative analyses of differences in subjects, techniques and styles of Instagram photographs from different global cities using very large image samples, and suggesting that "the subjects and styles of photographs are significantly influenced by social, cultural, and aesthetic values of a given location or demographic" (Manovich, 2017, p. 26).

In the case of Instagram, the issue of visual templatability surely opens up a number of possible research questions, however "very little research on specific Instagram sub-vernaculars has been carried out so far [...] both within and across disparate fields" (Caliandro & Graham, 2020, p. 2). Such research ideas might be fruitfully developed, and some interesting leads could possibly derive from recent explorations, for example, of Instagram and street art (MacDowall, 2019), and Instagram and news photography.

In particular, it could be argued that the field of visual news production and consumption

had faced early on the coming changes of mobile photography, visual social media and digital platformization, in terms of both aesthetic shifts and multiplication of social actors and practices. For example, in the case of photojournalism, such correlated dichotomies as "amateur vs. professional" and "digital vs. analogue" have been discursively — and not without conflict — played out during at least the first decade of this century, in relation to the increasingly diffuse digital technologies, social media affordances and practices that allowed forms of "citizen photojournalism" and non-professional visual news making to become increasingly relevant and publicly visible. This was especially the case during certain major crises, from the Abu Ghraib scandal to the 7/7 London bombings and the so-called "Arab Spring," among others (e.g. Anden-Papadopoulos & Pantti, 2011; Allan, 2017). The focus on (vintage) filters and retro-intensified aesthetics of Instagram (and others, such as Hipstamatic) directly addressed those dichotomies and had also great implications within wider and long-lasting debates on news photographic post-production and manipulation, thus raising renewed issues concerning photo-journalistic professionalism, authority, and, especially, notions of *authenticity* and *objectivity* (Alper, 2014; Borges-Rey, 2015; Solaroli, 2015a). Over the last fifteen years, many cases of contested, post-produced professional news photographs — including the professional debates which emerged after a square grid of four photographs taken in Afghanistan with the Hipstamatic app was published on the front page of the New York Times in 2010, later earning the staff photographer a Picture of the Year International award (Alper, 2014) — clearly showed the impact of such social, professional, and technological changes on historical-epistemological tensions concerning the professional ideal of visual news "objectivity" and the social process of construction of aesthetic conventions and professional-ethic standards in photojournalism, especially among professional photojournalists adopting new visual technologies and platforms (Solaroli, 2015a).[4]

More recently, the concept of *mechanical objectivity* has been employed to refer to accepted conventions and professional ideals of both photojournalism and contemporary platform news algorithms (Carlson, 2019). The promise of mechanical objectivity can in fact be defined as "the assumption of the epistemic utility of mechanical operations, whether overtly expressed" as in the case of news photography, "or implicitly embedded in practice" as in the "more recent rise of algorithmic practices and automated systems throughout the news-making process", playing "an increasingly central role in what audiences see" (Carlson, 2019, p. 2). However, *algorithmic objectivity* (Gillespie, 2014) can have also dark sides, or at least unexpected and constraining consequences. A major and quite revealing case occurred in 2016. As Van Dijck, Poell and de Waal (2018, p. 44) recall, "when Facebook repeatedly deleted the iconic 'Terror of War' picture of a fleeing naked child after a napalm bombing during the Vietnam War, its removal triggered controversy", because it represented the output of a process of content moderation that did not allow the online publication of images of nudity, yet failing to distinguish between a generic image of child pornography and one of the most widely known iconic news photographs of the last century. As the example clearly shows, the constantly evolving strategies and norms of content moderation employed by such platforms as Facebook and Instagram

4. As an anecdote revealing the shifting aesthetic standards and professional ideals but also the confusions and complexities of this historical phase, it would be enough to recall that, during the wide debates regarding the photo that won the prestigious World Press Photo of the Year award in 2013, which had been legitimately post-produced with innovative software technologies yet accused of illegitimate photo manipulation, an expert who had been entrusted to evaluate it eventually referred to its affective visual enhancement by defining the photograph's final shape as "Instagram-y" — further confirming the impact of the platform on visual culture (Solaroli, 2015a).

can deeply affect the forms and indeed possibilities of the visual news process, struggling with multiple historical and cultural specificities. In this case, only after extensive online reactions, Facebook recognized the importance of the image beyond the fact that it would normally violate the platform's standards. Likewise, Instagram initially banned every kind of nudity but, especially after wide online outcries for images of breastfeeding mothers being removed (Locatelli, 2017), it revised its guidelines allowing nudity in specific cases, including photos of paintings and sculptures, yet not in other, often contested, cases (Caldeira et al., 2018; Leaver et al., 2020).

Interestingly, the social and algorithmically automated forms and rules of content moderation that initially blocked the online diffusion of the famous Vietnam war's iconic news photograph might also imply, "ironically, that if such picture were taken today, it could no longer become iconic through a system of news selection dominated by Facebook and platforms with similar community standards" (Van Dijck et al., 2018, p. 64) — raising questions on the possible dynamics and forms of visual cultural iconicity and iconic power in the platform society, in relation to the digital inflation of potential icons, the algorithmically driven selection of heightened visual contents, and the status and meaning of iconic images, defined not just by their content but also by their performative effects and the platformized networks of relations that come to take shape around and through them (Hariman & Lucaites, 2018; Mortensen et al., 2017; Dahmen & Morrison, 2016; Solaroli, 2015b).

Finally, Instagram is increasingly acquiring a significant journalistic value for professionals and organizations as a platform for detecting potentially newsworthy topics and simultaneously promoting visual news contents. As a platform for potential visual news consumption, however, it is claimed to be increasingly subjected to the logic of templatability that could reduce serendipitous user explorations — apparently confirming that "even though platforms enable the circulation of a wide range of cultural products and forms of expression, platformization is not necessarily conducive to a diverse cultural landscape and democratic public sphere" (Poell, 2020, p. 654). According to Leaver, Highfield and Abidin (2020, p. 214),

> for all Instagram's success, or indeed, because of it, the experience of Instagram is increasingly challenged by the logic of templatability which is evident across the platform [...] Instagram's drive to serve metrics for Influencers and advertisers has meant both are increasingly behaving in similar ways [...] to crafting content which maximizes the attention of Instagram's algorithms. While Instagram's Discover pages are meant to highlight new material for users, the multiple signals of other users' comments and likes, and machine vision algorithms looking for aesthetically similar content, mean Discover is largely populated with content *similar* to material a user has already seen, greatly reducing the serendipity and spontaneity of exploring Instagram.

As showed by the last Digital News Report of the Reuters Institute for the Study of Journalism, in a variety of countries and across age groups the use of Instagram for news has doubled over the last two years, with the platform looking likely to overtake Twitter soon in this regard (Newman et al., 2020). However, beyond initial exceptions (e.g. Towner & Munoz, 2020; Larsson, 2018; see also Koliska & Roberts, 2015), as a visual news platform Instagram is still largely uninvestigated. Future research projects will necessarily have to take into account the distinctive platform logics and mechanisms so far reconstructed, as well as new, challenging, epistemological and methodological issues concerning digital visual research design strategies

(e.g. Faulkner et al., 2018; Rogers, 2018; Highfield & Leaver, 2016; Lindholm et al., 2020; Pearce et al., 2020; Manovich, 2020).

5 Looking Ahead for Future Research Paths

This review essay aimed at reconstructing some of the major research paths, results, and ongoing challenges within the framework of the platform society and in relation to key cultural industry sectors. To conclude this overview, on the basis of the research patterns so far addressed, we would like to outline three domains that we believe to be, among others, deeply relevant for possible future research in this field. These areas of further necessary inquiry deal with *aesthetics*, *value(s)*, and *users*.

Firstly, such a wide, deep and ongoing digital transformation implies a variety of relevant social and cultural implications that more or less directly affect and shape the aesthetic forms, design patterns and more or less distinctive or hybrid genre categories of platformized cultural objects: from the length and structure of successful songs on Spotify, to the writing and positioning of specific types of titles for boosting vastly read online news articles — as recently observed, for example, by Hindman (2018) and Christin (2020) — to the role of images in platform journalism, including the visual dimension of fake news, and to Instagram's platform vernaculars that meet a logic of visual templatability. If early efforts to understand the relationships between digital platforms and cultural production have mostly been devoted to outlining the mechanisms of distribution, then new research directions should also be linked to the analyses of languages, aesthetics and symbolic forms, which would necessarily benefit from interdisciplinary frameworks and innovative methodological choices.

Secondly, the deeply platformized reconfiguration of digital cultural industries would critically require further investigation of the changes in terms of value and values within different cultural fields. In other words, we invite scholars to look both at how the economic and symbolic value of culture is changing, and the changing relevance of cultural products in social lives and within household moral economies, including the social experiences that platformized culture is able to catalyze and trigger. On the one hand, such as in the case of music, and partially in journalism, digitalized content has been transformed from more or less concrete objects to be purchased (and stored) into services that people are to some degree willing to subscribe to; on the other hand, today the social value of culture is arguably at stake, as it is exemplified also by the discursive tensions around innovation and crisis that repeatedly frame professional journalism. At the same time, the hierarchies of value within specific fields of cultural production might be undergoing processes of reshaping in the new platformized media environment, and as a consequence future research on platforms and cultural industries should pay particular attention to issues of performance of value (see Stark, 2020).

Finally, as this paper has showed, research on platforms and cultural industry sectors has not yet been consistently and systematically attentive to the dimension of consumption. On this basis, it could be argued that one more crucial domain that might be further empirically investigated deals with the situated social and cognitive practices, and performative experiences, enacted by platforms' users. In this area of inquiry, it might be potentially revealing to focus also on patterns of sub-cultural consumption and tactics of platform power counterbalance, through which users can articulate alternative meanings and advance critical forms of symbolic resistance to mainstream forms of platformized culture. Initial examples include efforts to protest against algorithmic personalization, such as creative attempts at "playing against" or "gaming" Spotify's or Instagram's algorithmic systems, or even practices of digital disconnec-

tion (e.g. Petre et al., 2019; Mahnke, 2019; O'Meara, 2019; Trerè et al., 2020). Within social sciences, media studies and cultural studies, the wide area of scholarly research on consumption has a long history, lessons from which it could be possible to benefit in order to mobilize and innovate methods and concepts to address contemporary digital cultural user experience — even in its political implications. A few years ago, in an influential collective debate on the promise of online participation, José Van Dijck ended up asking:

> The role of users requires as much painstaking research as the role of platform owners. How much can, do, and should they understand about social media dynamics and their connective logic? In a world that is increasingly governed by high-tech systems operated by specialized info-engineers, what level of understanding is attainable for middle-class users who are well educated and willing to engage, but unaware of the powerful mechanisms guiding them? (Clark et al., 2014, p. 1449).

We believe that this is a question still worth being asked, even extended, and above all answered, in today's platform society.

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